

**REPORT  
ON  
WORKSHOP FOR MASTER  
RESOURCE PERSONS**  
On  
**UNDERSTANDING WEATHER AND CLIMATE**

Organized by  
**PLANETARY SOCIETY, INDIA**

With support of  
**ANDHRA PRADESH  
STATE COUNCIL OF SCIENCE & TECHNOLOGY (APCOST)**

Catalyzed and Supported by  
**RASHTRIYA VYGAN EVAM  
PRODYOGIKI SANCHAR PARISHAD (RVPSP)  
Dept. of Science and Technology,  
Government of India**

**DATE : 7<sup>th</sup> to 9<sup>th</sup> August, 2010  
VENUE: JEEVANA JYOTHI RETREAT HOUSE**

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**OBJECTIVES**  
**OF**  
**THREE DAY WORKSHOP**  
**FOR**  
**MASTER RESOURCE PERSON**  
**ON**  
**CLIMATE CHANGE**

## **OBJECTIVES OF THE PROJECT :**

1. To create better understanding and awareness amongst various target groups about weather, climate and hazards and its affect on our day-to day lives;
2. To inculcate a spirit of enquiry, questioning, observation, analysis and interpretation of data by understanding weather patterns through low-cost weather observation kits and models; Learning and taking scientifically valid measurements;
3. Interdependence in food web, study of food web specific to climate zones, threats to environment due to extinction of certain plant and animal species;
4. To stimulate student interest in pursuing careers in S&T especially in areas of climate, meteorology, hazard management, etc.
5. To create awareness and understanding about global warming, soil, air and water pollution and their effect on Hydrological, Carbon, Nitrogen Cycles;
6. To familiarize rural opinion makers with remote sensing techniques and their applications;

BACKGROUND  
OF  
WORKSHOP  
FOR  
MASTER RESOURCE PERSONS  
ON  
UNDERSTANDING WEATHER AND  
CLIMATE

## **BACKGROUND IN BREIF:**

A major component under the Outreach Campaign of International Year of Planet Earth programme is on understanding of weather patterns and climate change and its effects. The programme aims to create a better understanding and awareness about physics and chemistry of the atmosphere, weather, climate change, natural hazards, sustainable living, etc. The programme aimed to focus at understanding of short and long term impact of man-made and natural activities on climate change, understanding of natural hazards and capacity building for decisions making when there is an option available. Scope of the module was limited to creating awareness about climate and hazards related issues through out reach programmes and noteworthy change of behaviour of the community.

RVPSP conceptualized a campaign for Scientific Awareness with NCSTC-Network and S&T Councils and catalyzed a range of multiple-level activities which were conducted all over the country. Outreach activities were organized to focus on issue of geographical considerations like desert, coast, mountains region, etc. Water and Sanitation, Health & Nutrition, Environment and Biodiversity Conservation, Disaster Preparedness, Soil Management and IT were the major areas of concern for this initiative. During year 2004 more than 6000 performances were held in as many villages and nearly 15000 schools were sensitized. The activities have been successful in raising the level of understanding of science in the public.

Now a multimodal program on “Understanding Planet Earth” has been developed by RVPSP, DST through a process of wide consultation, since UN has adopted 2008 as International Year of Planet Earth through a proclamation in the General Assembly in New York on December 22, 2005. Three years period from 2007-09 will be needed to complete this ambitious programme. RVPSP is focusing on the outreach activities. Better understanding of factors responsible for maintaining healthy soil, water, natural resources, agriculture, etc., are some of the issues to be addressed under this program.

Under the initiative “Understanding of Climate and Hazards” RVPSP, DST proposed to develop hands-on training module for village leaders and high school science teachers. Some of the suggested topics are:

- 1) Understanding of atmosphere, cloud formation, cyclones and storms
- 2) Science behind Rainbows, Atmospheric optics
- 3) Study of climate change and factors responsible for it
- 4) Learning and taking scientifically valid measurements in the fields of meteorology, pollution levels, Air Quality Monitoring, etc.
- 5) Study of Hydrological, Carbon, Nitrogen Cycles
- 6) Sustainable practices for better rural economics

DST, RVSP, has developed kits, booklets and training manuals and reference material in the form of CD Rom and DVDs on basics of atmosphere, climate and hazards, etc. Each of these topics was developed into interactive modules to foster understanding on weather and climate.

Primary target group would be high school students and their science teachers (who will be imparted resource persons training) for most of the objectives listed above; Second group will be of village leaders who will largely organize and participate in Vigyan Vad-Vivad Sabhas in gram panchayts for optimum agricultural practices popular science lectures on issues and activities pertaining to small farmers and artisans.

Under the guidance of resource teachers, school students are expected engage in collection of simple weather data. In the process they can understand method of science like observation, collection and analysis of data, estimation, measurements, precision, usage of data and interpretation, etc. Students will also do some hands on activities for understanding concepts like acid rain, atmosphere, pressure, cloud formation, dew, lightening, and other related phenomenon, etc.

**NEED OF THE WORKSHOP :** For this need of master trainers was felt for organizing various activities school students and village leaders in all the 23 districts of A.P. Hence

it was proposed to organize a sensitization workshop for the Master Resource Persons (MRPs) for 4 days with the help of the experts and the basic background material in the form of information booklets; CDs etc. provided by DST, GoI.

**MASTER RESOURCE PERSONS/ NCSC DISTRICT COORDINATORS:** The role of District Coordinator at District level has been phenomenal contributing the success of National Children's Science Congress. Importantly District Coordinators have served as vehicle to disseminate knowledge in true spirit of UNITED NATIONS Proclaimed Years like 2007-2009 which is declared as "International Year of Planet Earth".

**APCOST EFFORTS - Need of Orientation:** Considering the role of District Coordinators APCOST has always been forefront to supplement their efforts. In regard to MASTER RESOURCE PERSON TRAINING PROGRAMME (MRP'S) on Climate Change D.C. were understood to be perfect instrument to carry out the objectives of the Workshop to grass root levels.

# METHODOLOGY

## **METHODOLOGY:**

**1. Target Group - District Coordinators – Invitation:** the workshop was conducted for 46 Science Teachers (also designated as District Coordinators & District Academic Coordinators of NCSC) with kind support of APCOST.

**2. Resource Person – Various Subjects:** Experts in the field were identified to provide training to the participants. Efforts were made for practical demonstration-cum-talk approach.

**3. Material/Resources for Target Group :** Material compiled by the society with kind assistance of visiting experts of the programme & APCOST were prepared. Wherein guidelines and Weather Kit provided by NCSTC, DST, Govt of India, was provided to District Coordinators in hard as well as soft copy. Importantly a special Compact Disk were prepared to assist the beneficiaries.

**4. Food/Boarding and Lodging:** Participants of the session were provided with material like notepads, etc.. arrangements were made for Boarding and Lodging.

**5. Venue other arrangements:** all required arrangements like venue, invitation to experts etc.. were handled by the society. Importantly the experts were honored accordingly.

**6. Field Visit :** one of the cardinal activity of the workshop was to visit research institutions. Wherein arrangements for on field exposure to Weather Instruments, Remote Sensing applications was made.

**7. Media Coordination:** Preparation of Media Kit Virtual, Press Invitation, Press Note, and Press Release were handled by the society.

**7. Result :** With all above the orientation programme was successfully conducted which benefited the District Coordinators tremendously.



**TARGET GROUP**

# **OPENING CEREMONY**

PROGRAMME SHEET  
OPENING CEREMONY  
7<sup>th</sup> August 2010

PRAYER
Welcome Address: About Workshop on Understanding Weather and Climate Prof.T.V. Krishna Reddy Member Secretary, APCOST
Presidential address Shri T. Tirupati Rao Vice Chancellor, Osmania University
Awards Ceremony
Address by Dr.Peddireddi Ramachandra Reddy Garu Hon'ble Minister for Forests, Environment, Science & Technology, Govt of A.P. Inauguration of the workshop. Unveiling of the Kit
Presentation of Memento to Guests
Vote of Thanks



**\* WELCOMING THE GUESTS**  
**PARTICIPANT MASTER RESOUCCE**  
**PERSONS**

**&**

**SCIENTISTS/ RESOURCE**  
**PERSONS**

**\* PRAYER**

# PRAYER



Students singing the prayer



Chief Guests and other Dignitaries standing for Prayer



Participants, Media Representatives, Officials can also be seen

**BOQUETS  
PRESENTATION  
TO GUESTS**





**Dr. P. Ramachandra Reddy, Hon'ble Minister for Forests, Environment, Science & Technology, Govt. of A.P.**



**Prof. T. Tirupati Rao, Vice Chancellor, Osmania University, Hyderabad**





**Prof. K. Janardhana Reddy, Principal, Osmania  
University College of Science, Hyderabad**



**Prof. T.V. Krishna Reddy, Member Secretary  
APCOST**

**WELCOME ADDRESS**

**BY**

**PROF.T.V.KRISHNA REDDY**

**Member Secretary**

**APCOST**



**PROF. T.V. KRISHNA REDDY,**  
Member Secretary  
Andhra Pradesh State Council of Science & Technology  
presenting  
**Welcome Address**

Prof. T.V.Krishna Reddy, Member Secretary, APCOST, in his welcome address, made a presentation on the focus areas of APCOST and briefed the participants about the need-based, resource-based and location-specific projects/ programs being taken up by APCOST. He also briefed about the salient features of the Andhra Pradesh Scientist Awards – 2010 and Workshop for Master Resource Persons (MRPs) on Understanding Weather & Climate

**Prof.T.V.Krishna Reddy the wokshop aims :**

- To create better understanding and awareness amongst various target groups about weather, climate and hazards and its affect on our day-to day lives.
- To inculcate a spirit of enquiry, questioning, observation, analysis and interpretation of data by understanding weather patterns through low-cost weather observation kits and models; Learning and taking scientifically valid measurements.
- Interdependence in food web, study of food web specific to climate zones, threats to environment due to extinction of certain plant and animal species.
- To stimulate student interest in pursuing careers in S&T especially in areas of climate, meteorology, hazard management, etc.
- To create awareness and understanding about global warming, soil, air and water pollution and their effect of Hydrological, Carbon, Nitrogen Cycles.
- To familiarize rural opinion makers with remote sensing techniques and their applications.

(PTO)

Prof. T.V.Krishna Reddy welcomed the target group which included District Coordinators, District Academic Coordinators of NCSC from 23 districts in AP and 5 Field Officers of APCOST (Total strength of participants is around 51)

**He appraised the chief guest and other dignitaries with topics of workshop which are :**

- Basic Knowledge about Atmosphere, Climate and Weather
- Bio-diversity – Study of Flora and Fauna, Identification of Climate Zone, Interdependence in Food Web, Study of Food Web specific to Climate Zones
- Climate Changes – Natural factors, man-made factors
- Climate Models – Glaciers, Monsoon variability, Extreme Weather Events
- Importance of S&T Communication
- Study of Rainbows, Atmospheric Optics, Cloud Formation, Cyclones and Storms
- Understand the Usage of Functioning of Cup Anemometer, Dew Gauge, Barometer, Hygrometer, Thermometer, Rain gauge, PH meter etc.
- Study of Remote Sensing and its application (APSRAC)
- Study of Hydrological, Carbon and Nitrogen cycles
- Visit to nearby Meteorological Centre (IMD, Hyderabad)

**Further the Member Secretary read out the names of the Resource Persons**

1. Dr. C.V. V. Bhadram, Former director of the Indian Meteorological Centre in Hyderabad
2. Prof. D.Rajreddy, Principal Scientist (Agromat), Acharya N.G. Ranga Agricultural University, Hyd.
3. T. Srikumar, Senior Lecturer in Physics, Andhra Loyala College, Vijaywada
4. W.G. PRASANA KUMAR, Director A.P. N.G.C, Hyderabad

5. Dr.V.B. Ramana Murthy IFS, A.P.Forest Academy, Hyderabad
6. Prof. A.C.Narayana, Professor, University Centre for Earth and Space Sciences,  
Central University, Hyderabad
7. N. Sri Raghunandan Kumar, General Secretary, Planetary Society, India,  
Hyderabad
8. Sri K. Mruthyunjaya Reddy, Director General, APSRAC, Hyderabad
9. Dr.Satya Kumar, Director, IMD, Hyderabad

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**MOTIVATIONAL ADDRESS**

**BY**

**DR. PEDDIREDDI RAMACHANDRA REDDY GARU,**  
**HON'BLE MINISTER**  
**FOR**  
**FORESTS, ENVIRONMENT, SCIENCE &**  
**TECHNOLOGY,**  
**GOVT. OF ANDHRA PRADESH**





**DR. PEDDIREDDI RAMACHANDRA REDDY,  
Hon'ble Minister for Forests, Environment,  
Science & Technology, Govt. of A.P  
addressing the participants with his  
motivational message**



**Speech of Dr. Peddireddi Ramachandra Reddy garu, Hon'ble Minister for  
Forests, Environment, Science & Technology, Govt. of Andhra Pradesh**

**Participating as** : **Chief Guest**  
**Occasion** : **Andhra Pradesh Scientist Awards – 2010 &  
Workshop for Master Resource Persons (MRPs) on  
Understanding Weather & Climate**  
**Venue** : **Jeevan Jyothi Retreat House, Chikoti Gardens, Begumpet,  
Hyderabad**  
**Date** : **07-08-2010**  
**Time** : **9.30 a.m.**

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Hon'ble Vice Chancellor Prof. T.Tirupati Rao garu

Prof. T. V. Krishna Reddy, Member Secretary, APCOST

Prof. K. Janardhana Reddy, Principal, University College of Science, Osmania University

Andhra Pradesh Scientist Awardees, Resource Persons, Participants, invitees, Ladies and Gentlemen, print & electronic media

I am very happy to be here today amongst the august gathering of intellectuals from various fields of science & technology. As you all know, presentation of Andhra Pradesh Scientist Awards is a very important and prestigious annual event of APCOST in which the scientific/academic fraternity of the state are honored for their outstanding contributions in the field of science & technology. I congratulate

Prof. V. Daswanth Reddy, Osmania University

Prof. M. Joginatha Swamy, University of Hyderabad

Prof. N. Veeraiah, Nagarjuna University

Dr. A. Sujatha, AP Horticultural University

Dr.M.Anji Reddy,Jawaharlal Nehru Technological University

for having won the A.P. Scientist Award for the year 2010. I also urge upon the awardees to further their scientific research for the benefit of society and environment.

I am sure that such awards would definitely make like-minded scientists/academicians to emulate the awardees for improving their intellectual abilities, which would benefit the state as a whole.

I am sure that you would all appreciate that progress in any sector depends on the developments taking place in science & technology. Furthering Science & Technology should be the prime need of all of us just the way it has been nurtured by our elders. Andhra Pradesh is one of the fastest developing states in the country with thriving scientific and technological workforce having presence all over the globe. It is a good sign that the students from Andhra Pradesh are a majority in the premier institutions such as Indian Institute of Technology, National Institute of Technology, Indian Institute of Science and other leading universities in India and abroad. This it self speaks volumes of our academic and scientific outlook.

Climate Change is another important area, I understand, on which APCOST is currently concentrating. Climate change deserves it. Climate change is posing a significant threat to public health. The incidence of mosquito-borne diseases, including malaria, dengue, and viral infections are among those diseases most sensitive to climate change which currently claim the lives of millions of people and this is expected to grow in future.

National Action Plan on Climate Change (NAPCC) announced by the Govt. of India outlined the existing & future policies and programs addressing climate mitigation and adaptation.

APCOST is formulating a number of programs such as Centres for Climate Change, Workshops and Sensitization Camps etc. to address the problems associated with Global Warming.

I declare open the Workshop on understanding Weather and Climate being organized by APCOST for three days from today. I strongly believe that the workshop would bring in the required stimulus among the District Coordinators, District Academic Coordinators and the Field Officers to revive certain age-old practices that protect our Mother Earth from the impact of Climate Change.

I congratulate Prof. T.V.Krishna Reddy, Member Secretary, APCOST and his team for undertaking useful scientific and technological interventions for the benefit of society and environment.

I thank one and all.

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MESSAGE

BY

PROF. T. TIRUPATI RAO,  
Vice Chancellor,  
Osmania University, Hyderabad



**PROF. T. TIRUPATI RAO,**  
Vice Chancellor,  
Osmania University, Hyderabad  
delivering **Presidential Address.**

**Speech of Prof. T. Tirupati Rao, Vice Chancellor, Osmania University, Hyderabad**

**Participating as : President in the Function**  
**Occasion : Andhra Pradesh Scientist Awards – 2010 & Workshop for Master Resource Persons (MRPs) on Understanding Weather & Climate**  
**Venue : Jeevan Jyothi Retreat House, Chikoti Gardens, Begumpet, Hyderabad**  
**Date : 07-08-2010**  
**Time : 9.15 a.m.**

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Honourable Minister for Forests, Environment, Science & Technology, Govt. of Andhra Pradesh & Chairman, Executive Committee, APCOST, Dr. Peddireddi Ramachandra Reddy garu

Prof. T. V. Krishna Reddy, Member Secretary, APCOST

Prof. K. Janardhana Reddy, Principal, University College of Science, Osmania University

Andhra Pradesh Scientist Awardees, Resource Persons, Participants, invitees, Ladies and gentlemen, print & electronic media

It gives me immense pleasure to be here today at the Function of presentation of Andhra Pradesh Scientist Awards – 2010 and also the inauguration of the Workshop for Master Resource Persons on Understanding Weather & Climate being organized by APCOST.

As we all know, it is a matter of pride and great gesture that APCOST is recognizing the meritorious contributions of our Scientists and Academicians by honouring them with the Andhra Pradesh Scientist Awards.

As a matter of fact, I personally believe that such an Award will not only inspire the scientists and academicians in pursuing their scientific research but also motivate them to

enhance their thirst for new knowledge which would be helpful to the society and environment.

I congratulate all the A.P. Scientist Awardees for the year 2010 and wish them every success in their future endeavours.

It is a welcome sign that APCOST is taking up the Global Warming and Climate Change as the focus areas in order to solve certain issues relating to CO<sub>2</sub> emissions, glaciers melting, raising sea level etc.

The topics of the Workshop on understanding Weather and Climate being organized by APCOST are aptly designed to motivate the participants in attempting to bring about a change from the school-level.

I thank Dr. Peddireddi Ramachandra Reddy garu, Hon'ble Minister for Forests, Environment, Science & Technology, Govt. of Andhra Pradesh & Chairman, Executive Committee, APCOST and congratulate Prof. T.V.Krishna Reddy, Member Secretary, APCOST and his team for initiating diverse activities targeting a wide range of public.

I thank one and all.

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**\*UNVEILING OF WEATHER KIT**

**\* LAUNCH OF THREE DAY  
WORKSHOP  
AND  
WEATHER KIT**



# UNVEILING OF WEATHER KIT, MATERIAL AND SPECIAL C.D



**Launch of Weather  
Kit for  
Three Day  
Workshop**

# VOTE OF THANKS

## VOTE OF THANKS



Dr.C.V..Rama Krishna Field Officer presenting  
Vote of thanks







Chief Guest and other guest after the opening Ceremony



SESSIONS  
BY  
RESOURCE PERSONS

## **Overview of Various Sessions conducted by Resource Persons for the Benefit of Participants**

While keeping the call of United Nations effort in mind the sessions by resource persons were conducted successfully. Eminent scientists/experts were identified and invited to make the workshop more fruitful for the participant target group and indirect beneficiaries (students) in true spirit of the workshop as envisioned by NCSC, DST, Govt Of India. Here is brief gist.

### **Resource Persons**

1. Dr. C.V. V. Bhadram, Former director of the Indian Meteorological Centre in Hyderabad
2. Prof. D.Rajreddy, Principal Scientist (Agromat), Acharya N.G. Ranga Agricultural University, Hyd.
3. Dr.V.B. Ramana Murthy IFS, A.P.Forest Academy, Hyderabad
4. Prof. A.C.Narayana, Professor, University Centre for Earth and Space Sciences, Central University, Hyderabad
5. T. Srikumar, Senior Lecturer in Physics, Andhra Loyala College, Vijaywada
6. W.G. PRASANA KUMAR, Director A.P. N.G.C, Hyderabad
7. N. Sri Raghunandan Kumar, General Secretary, Planetary Society, India, Hyderabad
8. Sri K. Mruthyunjaya Reddy, Director General, APSRAC, Hyderabad
9. Dr.Satya Kumar, Director, IMD, Hyderabad

**DR. C.V. V. BHADRAM**

FORMER DIRECTOR,  
INDIAN METEOROLOGICAL  
DEPARTMENT CENTRE  
HYDERABAD





Post Tea Break after Grand Opening Ceremony, Session by Resource Persons Begin.



Mr. Raghunandan Kumar reading out the gist of topics to be covered by Dr. Bhadram



Dr. C.V. V. Bhadram, Former director of the Indian Meteorological Centre in Hyderabad





Dr.Bhadram providing Study of rainbows, atmospheric optics scientific basis of the same Understanding of atmosphere, cloud formation, cyclones and storms



TOPICS COVERED
1. Basic Knowledge about Atmosphere Climate and weather
2. Provide basic information on : Climate of India climate zones Bio-diversity of India according to diverse climatic zones i.e arid zone tropical zone rain forests etc.
3. Study of rainbows atmospheric optics scientific basis of the same Understanding of atmosphere cloud formation cyclones and storms
<b>Note:</b> <i>Films and videos Quiz programmes Demonstration on CDs about clouds their types and role in prediction</i>

## TIMINGS:

Session I : 11.45 a.m. to 2. 45 p.m

After Lunch

Session II : 2.00 p.m. to 2.45pm

The Presentation begin with introduction to various basic concepts like Weather and Climate, Climate Change, Global Warming, Green House Gases where he Said

### Weather and Climate

- Weather refers to hourly or daily atmospheric phenomena, such as temperature, rain and wind.
- Climate is the average weather for a particular region and time period, usually taken over thirty years.

### Climate Change:

- Climate change is the change in average climatic conditions in a place or region over a time period that ranges from decades to hundreds of years. Climate change involves both natural changes and changes caused by human activity. Since the industrial revolution (1850), human activity has been changing and polluting the atmosphere in many ways. We now use cars and airplanes; we have large industries – all of which have an impact on our climate. The release and increase of green house gases **causes**, among other things, global warming.

### Global warming :

- Global warming refers to an average increase in Earth's temperature, which in turn causes changes in climate. A warmer planet may lead to changes in rainfall patterns, a rise in sea levels, and a wide range of impacts on plants, wildlife and humans. Many low-lying countries may become smaller by rising sea levels and

some small islands may become submerged. In addition, diseases such as malaria may appear in countries that are becoming warmer

Greenhouse gases:

- Human activity releases greenhouse gases (in particular carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>)) into the atmosphere, which enhances the greenhouse effect. Many of these gases come from fossil fuels such as oil, coal and natural gas used to run vehicles and to generate electricity for industries and households. When the atmosphere contains more greenhouse gases, the entire atmosphere and the Earth become warmer, as in a greenhouse.

Further in the course of his presentation Dr.Bhadram raised various questions pertaining to Problem with Greenhouse gases, Ozone Hole and then he went to explain

**What is the problem with greenhouse gases?**

- In 2009, there was about 38 per cent more carbon dioxide (CO<sub>2</sub>) in the atmosphere than in 1750. Global atmospheric concentrations of carbon dioxide and other greenhouse gases have increased markedly as a result of human activities. The more CO<sub>2</sub> we put into the air, the more temperatures could rise. Two major activities that increase CO<sub>2</sub> are the burning of fossil fuels and deforestation.
- Forests are sometimes called “carbon sinks” because they take CO<sub>2</sub> from the air and store it. When trees are cut down and burned, the CO<sub>2</sub> that is stored in them is released back into the air. Scientists believe that every year, 2 billion to 5

billion tonnes of CO<sub>2</sub> are released into the air from forests that are cut down and burned.

- Ozone and Ozone layer: . The air we breathe contains oxygen molecules that are made up of two oxygen atoms combined (O<sub>2</sub>). Ozone is a molecule made up of three oxygen atoms combined (O<sub>3</sub>). Ozone is everywhere in our atmosphere – but in different amounts
- The ozone layer is found high up in the atmosphere –lower stratosphere – and contains most of the ozone. It acts as a “sunscreen,” absorbing ultraviolet (UV) radiation and protecting life on earth (animals, plants and humans) from excessive UV exposure, which could be harmful.

### **What is the ozone hole?**

- A massive hole in the ozone layer over the Antarctica was first discovered in 1985. In 2009, the hole had expanded to about 25 million square kilometers. WMO and UNEP played a leading role in setting up the 1985 Vienna Convention for the Protection of the Ozone Layer. It is to control and monitor substances that could damage the ozone layer (for example, cooling chemicals in refrigerators).
- WMO and the scientific community monitor the development of ozone worldwide by using meteorological data obtained from the ground, balloons, aircraft and satellites.
- With the ozone hole, the amount of UV reaching us has slightly increased. This small increase does not mean that we cannot enjoy the outdoors, but we should always protect ourselves against the UV.

After brief session on some of the basics the Resource Person along with participants broke for Lunch to continue the second part of the session post lunch.

### **Post Lunch Session :**

Presentation of Dr.Bhadram then gained speed to cover Basic Meteorological Parameters like Surface, Upper Air, Atmospheric Pressure, Wind Direction, atmospheric Temperature.

Where in he explained :

### **Recording of Basic Meteorological Parameters**

#### **SUFRACE :**

Atmospheric Pressure

Wind Direction &

Speed

Rainfall

Duration of Sunshine

Temperatures –

Maximum, Minimum,

Dry Bulb, Wet Bulb

Clouds

Visibility

## **UPPER AIR**

Wind Direction & Speed

Air Temperature

Humidity

## **ATMOSPHERIC PRESSURE (using pictorial slide)**

i. KEW-PATTERN BAROMETER

ii. BAROGRAPH

( for continuous recording)

## **WIND DIRECTION & WIND SPEED**

i. WIND VANE ( gives wind direction on a 16 point compass)

ii. ANEMOMETER ( gives wind speed , reported in knots )

iii. RAIN GAUGE : Measures the amount of rainfall. A self recording rain gauge gives a continuous measure of rainfall.

iv. SUNSHINE RECORDER: Measures duration of bright sunlight

## **ATMOSPHERIC TEMPERATURE**

i. DRY BULB, WET BULB, MAXIMUM & MINIMUM THERMOMETERS ARE PLACED IN A SCIENTIFICALLY MADE WOODEN ENCLOSURE KNOWN AS STEVENSON'S SCREEN.

ii. THERMOGRAPH GIVES A CONTINUOUS RECORDING OF ATMOSPHERIC TEMPERATURE

**Then in the midway on his Presentation after lunch Dr.Bhadram explained about Upper Air Observation, Earth Sun Relationship, Radiation Balance**

**Wherein he explained :**

**UPPER AIR OBSERVATIONS :** Air is mainly composed of nitrogen, oxygen, and argon, which together constitute the major gases of the atmosphere. The remaining gases are often referred to as trace gases, among which are the greenhouse gases such as water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

Composition of dry atmosphere (percent by volume): He further explained the composition of Atmosphere.

- Nitrogen :78.08      Oxygen : 20.95
- Argon: 0.93      Carbon dioxide :0.03
- Neon:  $1.8 \times 10^{-3}$       Helium:  $5.24 \times 10^{-4}$
- Krypton:  $1.0 \times 10^{-4}$       Hydrogen:  $5.0 \times 10^{-5}$
- Xenon:  $8.0 \times 10^{-6}$       Ozone:  $1.0 \times 10^{-6}$
- Radon:  $6.0 \times 10^{-18}$
- Nitrogen and Oxygen make up 99% of air
- Water vapour plays a dominant role in atmospheric processes (thermodynamic & radiative)
- Ozone in high levels is important due to its radiative characteristics



## **EARTH-SUN RELATIONSHIP**

i. Solar radiation on Earth

ii. Electromagnetic Spectrum: under this Dr.Bhadram explained

- Sun's radiation is in the range 0.15 to 4.0  $\mu$  - Solar radiation (Short Wave Radiation)

Of total solar radiation 9%- ultraviolet, 45%- visible, 46%-infrared ranges.

- The Earth and atmosphere also emits radiation mostly in the infrared range 4.0 to 80.0  $\mu$  - Terrestrial radiation ( Long Wave Radiation)

**Radiation balance :** Absorbed sunlight raises the Earth's temperature. Emitted radiation or heat lowers the temperature. When absorbed sunlight and emitted heat balance each other, the Earth's temperature doesn't change - the radiation budget is in balance. The mean temperature of the Earth is 15°C.

Later Dr.Bhadram explained the Vertical profile of temperature.

**Further Dr.Bhadram Explained about Meteorological Seasons , Diverse agro-climatic regions in india, Monsoon Weather Systems,**

**METEOROLOGICAL SEASONS :** importantly he explained the various seasons for meteorological study.

- Winter season - Jan to Feb
- Pre monsoon season - Mar to May  
(or) Hot weather Period
- South West Monsoon - Jun to Sep
- Post monsoon season - Oct to Dec  
(or) North East monsoon

**INDIA HAS DIVERSE AGRO-CLIMATIC REGIONS:** Later Dr.Bhadram

explained about the Diverse agro-climatic region which is unique to INDIA.

- Large variation of Rainfall : 15 cm to 1100 cm
- Two-thirds of country : arid to semi-arid region
- Vast Coast line : Cyclonic storms
- Over 40 million hectares land : Periodical floods
- Hilly regions : Prone to land slides
- Around 56% of area : Vulnerable to seismic disturbances

**MONSOON WEATHER SYSTEMS :** Further he explained about the weather system of Monsoon. Wherein explained

- Monsoon lows
- Monsoon depressions
- Upper air circulations
- East-West upper air shear line
- North-south upper air troughs

Later he with the help of slide presented his analysis on

- i. Rainfall Status for the Period (01 June-30 September 2009)
- ii. Rainfall status for the period (1 June to 4<sup>th</sup> August 2010)

**Finally Dr.Bhadram explained about Tropical Cyclonic Storms, Causes of Damage, Dissemination of Cyclone Warnings.**

### **TROPICAL CYCLONIC STORMS**

Under this Dr. Presented the Maximum Sustained Wind Speed in Different Weather System.

Tropical cyclones over the Globe : Further he showed the trend of Tropical Cyclones over Globe.

#### **Horizontal and Vertical Structure :**

Horizontal structure of Tropical Cyclone was later briefed.

Vertical structure of TC

**CAUSES OF DAMAGE DUE TO CYCLONIC STORM:** further he explained the various caused of damage due to cyclonic storm.

- **Very Strong Winds :** Speed could be 200 kmph or more with severe cyclonic storms
- **Torrential Rainfall :** Heavy and prolonged rains cause flash floods leading to inundation.
- **Storm Surge :** It is an abnormal rise of sea level caused by a cyclone moving over a continental shelf. The surge is generated due to interaction of air, sea & land. About 90% of the total loss of life and property due to a cyclone is caused by storm surge alone.

**Dissemination of Cyclone Warnings :** the session concluded with how Warnings are communicated to people

1. Telephone, Fax and SMS
2. All India Radio and Television
3. Press/Media
4. Police W/T
5. CWDS through INSAT
6. IMD Website [www.imd.gov.in](http://www.imd.gov.in)

**PROF. D.RAJREDDY**

**PRINCIPAL SCIENTIST (AGROMAT)**

**ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY**



Prof. D.Rajreddy,  
Principal Scientist  
(Agromat),  
Acharya N.G. Ranga  
Agricultural University,  
Hyd.

Participants aptly  
listening to the  
resource person



P.Srinivas, Programmer,  
APCOST along with N.Sri  
Raghunandan Kumar listening.



Prof.Reddy presenting series of  
slides explaining various concepts.

TOPICS COVERED
<ol style="list-style-type: none"><li>1. .Monsoon variability</li><li>2. . Extreme weather events</li><li>3. .Interdependence in food web, study of food web specific to climate zones, threats to environment due to extinction of certain plant and animal species</li></ol> <p><b>Note :</b> <i>Practical session</i></p> <ol style="list-style-type: none"><li>4. Study of Hydrological, Carbon, Nitrogen Cycles</li></ol> <p><b>Note:</b> <i>Identification of these cycles in real life</i></p>

Timings :

2.45 p.m. to 6.00 p.m.

### **Noble prize – IPCC report :**

The presentation begin with explanation on how issue of climate change and the measures needed to counteract such change. In this regard Prof. Reddy appreciated the Norwegian Nobel Committee which decided in year 2007 for Nobel Peace Prize to be shared, in two equal parts, between the Intergovernmental Panel on Climate Change (IPCC) and Albert Arnold (Al) Gore Jr. for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.

**Greenhouse Gases :** While talking about climate change Prof. Reddy focused on the role played by various gasses since time immemorial.

- Carbon dioxide (CO<sub>2</sub> ),
- Methane, (CH<sub>4</sub>),
- Nitrous oxide (N<sub>2</sub>O),
- Chloro-fluoro-carbons (CFCs)
- Ozone (O<sub>3</sub>) and
- Water vapours (H<sub>2</sub>O)

Climate Change – IPCC - Observations : Prof. Reddy taking various excerpts from the IPCC report (2007) stated that

- **The earth has warmed by 0.74°C [0.56 to 0.92] during last 100-years (1906–2005)**
- **Frequency of heavy precipitation events has increased over most land areas**
- **More intense and longer droughts are observed over wider areas since the 1970s, in the tropics and subtropics.**
- **Average Arctic temperatures have increased at almost twice the global average rate in the past 100 years**
- **Mountain glaciers and snow cover have declined on average in both hemispheres**

**Rainfall – Changes :** He showcase the extreme changes which are occurring in rainfall. Further he presented the changes for Period 2071-2100 taking year 1961-1990 as baseline.

**Surface Air Temperature – Global Average :** he explained the Changes in annual mean surface air temperature (°C) for 2071-2100 relative to baseline (1961-1990). Whereas in later of the session he further explained **Projected global average temperature**. He pointed how Global average surface temperature was projected to rise by 1.4 to 6.1o C by 2100



**Monsoon during last eight years:** he further explained the trends of Monsoon in last eight years.

With the help of interactive slides Prof. Reddy explained about **monsoons which are relatively regular phenomenon interspersed with large extremes.**

**Further he explained :**

- i. Changes in annual mean surface air temperature (°C) for 2071-2100 relative to baseline (1961-1990)
- ii. Changes in rainfall (%) for the period 2071-2100 relative to baseline (1961-1990)
- iii. Changes in Extreme Rainfall – in which he pointed on Rainy Days and on Intensity mm per day.

He explained how Heavy precipitation events in India have increased during last 50 years.

**Analysis of Monsoon during last eight years:** while presenting his analysis on the monsoon in last eight year he talked about various extreme events which occurred.

- 2002 drought
- 20 day heat wave during May 2003 in Andhra Pradesh
- Extreme cold winter in the year 2002-03
- Drought like situation in India in July 2004
- Abnormal temperatures during March 2004 and Jan 2005
- Floods in 2005
- Cold wave 2005 - 06
- Floods in arid Rajasthan & AP and drought in NE regions in 2006
- Abnormal temperatures during 3rd week of Jan to 1st week of Feb 2007

## **IMPACT**

Moving on from his presentation on Climate Change – he further made the participants understand about the Impact.

### **Climate change is shrinking sheep**

**Crop Production – ISMR anomaly :** he explained graph of ISMR anomaly and its impact on crop production.

### **Projected climate change in India – Rabi/Kharif – 2010 Compared to 2070 :**

Further he explained how CO<sub>2</sub>, Temperature Increase, Rainfall Change would occur by year 2070 compared to year 2010.

**Opportunity – Rural Communities :** importantly he explained the need and opportunity which exists NOW to invest in rural communities to make them (*virtually*) immune to the swings and see-saws of climate change and enable them to thrive and contribute even more to the wealth and prosperity of the nation. He said this opportunity must not be missed.

**Threat to Wheat :** he explained the Potential Impact of Climate Change on Wheat Production in India while importantly analysed Impact of climate change on future opportunities for increasing wheat production.

**Apples :** Declining apple yields in Himachal due to inadequate chilling. He express his concern about

- i. Apple chilling hours are going down
- ii. Apple cultivation shifting to higher altitude

**Frost Damage :**

Frost damage is the number one weather hazard, on a planetary scale, as far as agricultural and forest economical losses are concerned  
He showcased how it effected Papaya, Mustard, Jatropha.

**RICE:** He then gave a overview of **Studies on influence of weather factors on growth and yield of Samba Mahsuri using CERES model**

**Jowar :** he explained the Combined effect of changes in temperature and CO<sub>2</sub> levels on grain yield of *rabi* jowar.

## **RECENT EXTREME CLIMATIC EVENTS**

While making participant understand about the Impact Prof. Reddy then talked about recent extreme climate events of greater concern.

Based on the report of A.K. Gupta , NCMRWF he explained about

- The 2002 drought in India : The month of July, turned out to be the driest in the recorded history since 1877.
- A 20-day heat wave during May 2003 in Andhra Pradesh, India: Maximum temperatures reached as high as 45-50°C, causing 1500 deaths.
- Conversely, extremely cold winter temperatures occurred across Asia in January, 2003.
- Thousands of deaths were attributed to extremely cold conditions in India and Bangladesh during January, 2003.
- Drought like situation in India in July 2004. All India rainfall was 19% below LPA.
- Kashmir Valley received one of the heaviest snowfall events in February, 2005
- Very Severe Heat Wave conditions over North and East India in June, 2005
- Exceptionally Heavy rains in Mumbai (94.4 cm) on 26 July, 2005
- During 2008, Andhra Pradesh experienced floods
- 2009 experienced both droughts and floods

**He then engaged the apt attention of participants on**

1. Exceptionally Heavy rains in Indian Metros-2005 Are these rains NORMAL?
2. Floods in Andhra Pradesh during the years 2005, 2006, 2007& 2008

**CHANGING RAINFALL/ TEMPERATURE TRENDS:** further Prof. Reddy went on to analyze various changes

1. **Shifts in Rainfall distribution - Bangalore**
2. **Rainfall (mm) departure of Telangana region during last decade (1998-07) over the mean of three decades (1968-97)**
3. **Minimum temperature (0C) trend during North-East monsoon season at Rudrur**

**CASE STUDY :**

Importantly Prof. Reddy then took HEAT WAVE – 003 as a CASE STUDY IN ANDHRA PRADESH

**He analyzed**

1. Maximum temperature distribution during severe heat wave conditions of 2003 in A.P.
2. Heat Wave (2003) – he explained how Damage to Mango Orchard occurred while pointing out how Custard Apple is tolerant to High temperatures.

**Then he further went to explain how live stock helps climate change.**

**LIVE STOCK AND CLIMATE CHANGE:** Very importantly Prof. Reddy went to explain how climate change was effecting Live Stock and contributing to climate change.

**Producing 1 KG beef:**

- Leads to the emission of greenhouse gases with a warming potential equivalent to 36.4 kg of CO<sub>2</sub>
- Releases fertilizing compounds equivalent to 340 g. of sulphur dioxide and 59 g. of phosphate
- Consumes 169 mega joules of energy
- 1 kg of beef is responsible for the equivalent of the amount of CO<sub>2</sub> emitted by the average European car every 250 km, and burns enough energy to light a 100-watt bulb for 20 days
- Over two-thirds of the energy goes towards producing and transporting the animals' feed

**Further as part of his Presentation in next few slides he explained and focused on ADAPTATION.**

## **ADAPTATION TO CLIMATE CHANGE**

### **1. Climate Change: Impact on agriculture**

- Increase in temperature (1.4-6.1°C), IPCC, 2007
- Change in precipitation and storm activity
- Widespread runoff
- Reduction in fresh water availability
- Droughts
- Permanent changes in pest distributions following extreme events
- Adverse impact on coastal agriculture due to rise in sea levels (17.5-57.5cm) and sea-water intrusion by 2100 and another 10-20cm rise if polar ice melting continues, IPCC, 2007

### **Trends in cropped area in Andhra Pradesh**

#### **Climatic risks associated with global warming are increasing:**

- Increase in temperatures, hot days, hot nights, and heat waves. Global mean temperatures have increased by 0.74°C during last 100 years.
- Increasing frequency of heavy precipitation events- more droughts and floods
- Tropical cyclones to become more intense, with heavier precipitation.

### **Projected impacts of climate change on Indian agriculture**

- CO<sub>2</sub> fertilization benefits = < 10% average
- In short-term, impacts of mean changes in climate are likely to be small
- In long run, impacts are likely to be large. Crop productivity to decrease by 10-40% by 2100.
- Some improvement in chickpea, mustard; rabi maize, sorghum and millets; and coconut in west coast; less frost damage in potato, peas, mustard
- Impact on livestock, fisheries and pests
- Impact on food trade

i. Managing increasing climatic variability is likely to be difficult but is critical

ii. Management of climatic risks is important for meeting challenges

Sequestering Carbon Creating Carbon Sinks

### **Adaptation options to climatic change**

i. Traditional management practices

ii. Changes in agronomic practices

### **Traditional adaptations/coping strategies to climatic stress practiced by farmers**

- Drought proofing by mixed cropping
- Changing varieties / crops / planting time: matching crop phenology with weather/water availability
- Diversifying income sources including livestock raising

### **Adaptation strategies to climate change in agriculture**

#### **Adaptation strategies in agriculture**

**Finally at the last part of his presentation he explained about Eco Friendly Management and AGROMET Advisories which play greater role.**

### **ECO FRIENDLY MANAGEMENT**

- i. Integrated Nutrient Management: Conjunctive use of Inorganic and Organic Nutrients for greater stability Need of the Hour.
- ii. In-situ moisture conservation and water harvesting: Farm Pond, Percolation Tank, Vegetative Barrier, Conservation Furrows
- iii. Water Harvesting: Contour trenching for runoff collection.
- iv. Relationship between total water received and grain yield of Aerobic rice in different dates of sowing.

Water Harvesting : Rainwater stored in farm pond can be judiciously utilized using sprinkler- Anantapur

Enlarging the Food Basket

Community Food Security System

Prepare for Sea-level Rise: Bioshield : Mangrove species *Excoecaria agallocha*

### **AGROMET ADVISORIES**

Agromet advisories are farmers bulletins prepared taking into account prevailing weather, soil and crop condition and weather prediction. Suggestions on measures/practices are provided in the bulletins to minimize the losses and optimize inputs in the form of irrigation, fertilizer or pesticides

- i. Medium range weather forecast
- ii. Information provided through AAS
- iii. Credit and Insurance
- iv. Extension, Training and Knowledge Connectivity

**T. SRIKUMAR**  
**SENIOR LECTURER IN PHYSICS**  
**ANDHRA LOYALA COLLEGE**  
**VIJAYWADA AND SCIENCE**  
**COMMUNICATOR**



**T. Srikumar, Senior Lecturer in Physics,  
Andhra Loyala College, Vijayawada**



Participants can be seen noting points as  
Mr.Kumar stressing importance of  
communicating Science and Technology





This Session was jointly held by Two prominent Science Communicators of the State. Mr.T. Srikumar & Mr.N.Sri Raghunandan Kumar



Master Sai Student of DAV School Demonstrating what farmers/individuals should do when thunder bolt strikes in order to escape injury or death



TOPICS
<p>Importance of S&amp;T Communication; Grooming of Science Communicators, obtaining feedback and modulating activities</p> <p><b>Note :</b> <i>Teachers will be trained and mock exercises may be done under guidance of experts</i></p>

As we near the end of the first decade of this new century, there is a growing perception around the world about the emergence of India as one of the potential global leaders in Science.

India's resources and strengths in science are considerable, but the potential is still far from realization. The rapid economic growth of the last fifteen years makes it feasible for the country to invest a great deal more in science than it could earlier. Contribution to Research & Development (R & D) from private sources is on the increase even though it still remains relatively small (Graphic 3). We believe, therefore, that the present time is a special one in the history of India's science as it offers an unusual opportunity to move towards a new and higher level than the one that we have become used to for decades.

At the school-leaving level there is great enthusiasm for science. A national science survey has found that the most popular subject among tenth standard students is mathematics (with a vote of 35%). In the international Olympiads, Indian students have been in the same class as USA, South Korea, China and Japan in terms of medals won in mathematics ; in biology, they rank above the US. However, as these bright young minds begin choosing their careers they prefer other options, chiefly because they see science as offering fewer opportunities.

Mr.Srikumar while explaining the importance of Science and Techonlogy said India to become a knowledge- based society and to be a world leader in science, we would need to re- double our national efforts to promote scientific temper, strengthen S & T infrastructure, expand our educational base, establish centers of excellence, foster a culture of innovation and channelize greater investments in research and development. We need to create a robust enabling environment for harnessing the creative energies of our youth, which can make a visible impact in improving the quality of life of our people.

He said major efforts should be made to inspire our scientific community , entrepreneurs, administrators, policy makers and civil society to search for solutions that would help build an inclusive, economically and socially vibrant, creative and an enterprising India, and to pursue excellence in science and technology for global good.

#### SCIENCE COMMUNICATORS:

Mr.Srikumar has called upon science communicators to help reach the existing Science and Technology solutions to the masses. Terming the 21st Century as the Age of Communication, he acknowledged the ability of media to mobilise public opinion through power of pen and power of images. He however, observed that there is a shortfall in the area of communicating Science and technology and expressed the need to enlarge the community of science communicators.

Expressing concern over the declining interest in science Mr.Srikumar pointed out that it was a global phenomenon – not only with youth coming to science but also with adults in aspects of understanding and appreciating science. He said that even in a country like USA, 50% of the adults surveyed didn't know that it takes 365 days for the Earth to orbit the Sun or for that matter electrons were smaller than the atom and if a similar survey was carried out in India, the results will not be much too different. It is for this reason, he said, that science communication is an important aspect of public education.

Mr.Srikumar said that communication ought to be a two way process - not just to bombard the public but also to bring in the feed back and information from the public to the decision makers. What we need today is a new mindset to use the power of communication to benefit all.

Further Mr.Kumar conducted various mock exercises, demo which can be replicated by participants in their schools explain the concepts of weather etc...

**W.G. PRASANA KUMAR**  
**DIRECTOR**  
**ANDHRA PRADESH**  
**NATIONAL GREEN CORPS**

TOPICS COVERED
Atmosphere various layers and its pollution, concept of Global Warming <b>Note:</b> <i>Understanding of simple instruments used for measuring atmospheric/air pollution</i>



**W.G. PRASANA KUMAR**  
Director, A.P. National Green Corps



Mr. Kumar Explaining Atmosphere various layers and its pollution,  
concept of Global Warming



Participants aptly listening to Mr.Kumar

Mr. W.G. Prasana Kumar begin his presentation explaining about atmosphere he said The gaseous envelope which surrounds the earth is called atmosphere. The atmospheric envelope gets thinner or less dense with height and fades away completely about 800km above the ground, where atmosphere ends. But 99% of the atmosphere is concentrated in the lower 30 km.

He added One can survive without food for few weeks, without water for three days, but without air only for five minutes. It serves as heat regulator; balancing earth temperature from excessive heat by absorbing and scattering solar radiation. It maintains the temperature, so that neither excessive heat in the day hours or excessive cold in the night hours affect us. It works like an umbrella which protects the earth and its biotic elements from the harmful ultraviolet rays, x-rays, cosmic rays as well as the meteoroids. It helps in circulation of material and energy within the atmospheric envelope through its own motion. Aided by the atmosphere, sound can be heard, Sun and Moon can be viewed in luminosity and the stars can glitter in the sky at night. Due to its impact the sky is seen as blue, and we see the splendour of sunset.

Mr. Kumar explained how Gases, water vapor and particulate matters are the main constituents of atmosphere. Nitrogen and oxygen constitute 99% volume of the atmosphere. Carbon dioxide is very important because of its ability to absorb heat. Ozone is another important gas, which can also absorb ultraviolet radiation. Nitrogen in air enters in to nitrogen cycle which maintains nitrogen content of the soil.

There are two approaches to divide the atmosphere. On the basis of chemical composition it is divided into two classes: homospheres- upto 80 km vertically and heterosphere – above 80 km. In other case on the basis of thermal profile it is divided into four: Troposphere- Up to 10 km, Stratosphere- 10-50 km, Mesosphere- 50- 80km, Thermosphere- above 80 km.

**Weather and climate:**

**Mr. Prasanna Kumar explained how Weather** is the instantaneous state of the atmosphere, or the sequence of the states of the atmosphere as time passes. He said it can be defined as the condition of the atmosphere at any given time and place.

**Climate** may be defined as the average condition of the weather based upon statistics collected over a period of minimum thirty years. **Climatology** is the study of climate. Climate lies at the heart of physical geography. Climate influences vegetation, soils, landforms, and water resources, and many human activities as well.

Weather & climatic conditions are determined by six major elements:

Air **temperature**, air **pressure**, **humidity** of the air, amount and kind of **cloud cover**, amount and kind of **precipitation**, and speed and direction of the **wind**. Weather condition for any region or for the whole **planet** can be charted on a weather map containing information about all six of these factors.

The six elements determining weather conditions result from the interaction of four basic physical elements the **Sun**, the earth's atmosphere, the **earth** itself, and Nature of landforms on the earth's surface.

In this context to know about the atmosphere and weather & climate particular, exploring different aspects of weather elements, air pollution and its impact on global climatic scenario of global warming and climate change are very important .

**Carbon and Climate Change/Global Warming :**

Further Mr. Prasanna Kumar said Carbon is an important component cycling in atmosphere, terrestrial and oceanic systems of the earth. Carbon dioxide released by the respiration of all living organisms is taken up by plants in the process of photosynthesis, in which the carbon is fixed as organic matter and the oxygen is released back into the atmosphere. When carbon in losses respiratory and non-respiratory processes are taken

into account in terrestrial biosphere, including fires, harvests/removals, erosion and export of dissolved organic carbon by rivers to the oceans, the rest of the accumulated carbon goes for long-term (decadal) storage. Thus carbon moves in complex chemical and physical transfers from sources, or reservoirs, where carbon is released, to sinks, where carbon is taken up. Earth's atmosphere, ocean, land, and living things can be both sources and sinks of carbon. In Earth's atmosphere, CO<sub>2</sub> is only about 0.03% by volume, but it is an important "greenhouse" gas. It traps in the lower atmosphere much of the heat radiated from the Earth's surface thereby maintaining the earth's radiation budget. However concentrations of CO<sub>2</sub> have been constantly increasing due to CO<sub>2</sub> emissions from burning of fossil fuel, deforestation and large scale disturbance of land for urbanization.

Due to increasing CO<sub>2</sub> concentrations, the global average surface temperature (the average of near surface air temperature over land, and sea surface temperature) has increased since 19<sup>th</sup> century. Over the 20<sup>th</sup> century the increase has been  $0.6 \pm 0.2^{\circ}\text{C}$ . India also witnessed a warming trend at a rate  $0.6^{\circ}\text{C}$  per century. In the state of Andhra Pradesh temperatures even rose to  $48.9^{\circ}\text{C}$  during May 2002, resulting in the highest one-week death toll on record. A number of environmental catastrophes have been consequently triggered as result of the climate variability. The initial impacts are tangible across the world including the decrease of arctic ice caps and disappearance of several vulnerable species. Current research across the world is targeted over potential carbon sequestration mechanism to mitigate this climate change caused by CO<sub>2</sub> rise. Not only that in many cases it is link with local condition also like temperature inversion.

Mr. Kumar gave examples of various places like Patencheru etc... in Andhra Pradesh where concentrations are alarmingly high.



**PROF. A.C.NARAYANA**  
**PROFESSOR**  
**UNIVERSITY CENTRE**  
**FOR**  
**EARTH AND SPACE SCIENCES,**  
**UNIVERSITY OF HYDERABAD**



**Prof. A.C. Narayana, Professor, University Centre for Earth and Space Sciences, Central University, Hyderabad**



Prof. Narayana giving overview of Various Natural Factors like volcanoes, earthquakes, cyclones, forest fires





Prof. Narayana explaining nuclear, man made disasters, , ozone hole, Global warming – Consequences in india



Prof. Narayana presenting the slide on receding glaciers-impact



Participants completely engrossed in the presentation

## TOPICS COVERED

1. Natural factors—volcanoes, earthquakes, cyclones, forest fires & Manmade factors—nuclear, man made disasters, Global warming, ozone hole

### 2.. Climate Models

- i. Glaciers receding
- ii. Consequences as noted in India

At the beginning of his Presentation Prof.A.C.S.Narayana gave a overview of various concepts like

- Earthquakes
- Volcanoes
- Tsunamis
- Storm Surges
- Floods
- Landslides
- Exogenic/Endogenic
- Impact on creatures, human life, surroundings

Earthquakes, volcanoes and landslides cannot be predicted

**Prof. Narayana further explained about Plate tectonic theory where he said** Plate Tectonic theory is based on an earth model characterized by a small number of lithospheric plates (there are 7 major plates and many smaller ones), 70 to 250 km thick, that float on a viscous under-layer called the asthenosphere.

These plates move relative to each other at rates of up to 10 cm/year.

The region where two plates come in contact is called a plate boundary. The way in which one plate moves relative to another determines the type of boundary: spreading, where the two plates move away from each other; subduction, where the two plates move toward each other and one slides beneath the other; and transform, where the two plates slide horizontally past each other.

Damage due to Earthquakes

- ❑ Vertical Forces
- ❑ Horizontal Forces
- ❑ Duration and Frequency

### **Tsunamis**

- Earthquakes and tsunamis
- Tsunamis can be generated when the sea floor abruptly deforms and vertically displaces the overlying water
- When these earthquakes occur beneath the sea, the water above the deformed area is displaced from its equilibrium position. Waves are formed as the displaced water mass, which acts under the influence of gravity attempts to regain its equilibrium. When large areas of the sea floor elevate or subside, a tsunami can be created.
- Not all earthquakes generate tsunamis
- Shallow focus earthquakes (depth less than 70 km) along subduction zones are responsible for most destructive tsunamis

❖ What Happens To a Tsunami as it Approaches Land?

- ❖ What Happens When a Tsunami Encounters Land?
- ❖ How Fast Can Tsunami Travel?
- ❖ How Big Can Tsunamis Grow?
- ❖ How frequently can Tsunamis recur?
- ❖ Tsunami Warning Centers in the Pacific Rim Countries
- ❖ Tsunami Research Activities
- ❖ Why No Warning Was Issued?
- ❖ The Need of the Hour

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*Further his presentation focused on Mitigation and Management of Natural Disasters*

## **MITIGATION AND MANAGEMENT OF NATURAL DISASTERS**

Where he explained about

- Four Phases of Response for disaster management
  - (i) Disaster Relief
  - (ii) Disaster Reconstruction
  - (iii) Disaster Management and Preparedness
  - (iv) Disaster reduction
- The first two phases focus on regions which have experienced the disaster
- The third looks at improved emergency response to future disasters to mitigate the adverse effects.
- The last one looks at modifying the habitat and infrastructure of all regions at risk such that destruction of life, habitat, infrastructure and livelihood are significantly reduced.

*Continuing his presentation he stressed on disaster reduction as follows.*

## **GUIDE TO DISASTER REDUCTION :**

Should address needs of communities at risk of inundation from floods, storm surges associated with tropical cyclones, earthquakes and tsunamis.

### **Needs/ Requirements :**

- Working Commission with structural, coastal and earthquake engineers, meteorologists, geoscientists and social scientists be established.
  - The ability to survive inundation without loss of life, and with acceptable physical damage to housing and infrastructure, any of the disaster events having a return period of 50 years
  - The minimization of the loss of life and damage to essential services while accepting significant physical damage to housing and infrastructure, any of the events having a return period of 100, 300, 500 and 1000 years.
  - The capacity for the communities themselves to implement the disaster program.
- Further focusing on Indian Coasts he explained how to disaster impact can be reduced.

## **DISASTER REDUCTION ALONG THE INDIAN COASTS :**

### **Two hazards – cyclones and tsunamis - threaten the coasts of Indian Ocean.**

- ❖ An average of 10 intense tropical cyclones each year can wreak havoc, since they can cause storm surges (up to 7 m reported in the Bay of Bengal) coupled with high waves, wind and floods.
- ❖ In the last 50 years they have produced more deaths and loss of livelihood than all the tsunamis of the last 280 years including the recent one.

Issues involved in effecting a reduction of disasters in the face of natural cataclysmic events, with particular emphasis on coastal communities.

How to Address the Problem?

- A quantified risk assessment by magnitude and return period of all cataclysmic events.
  - Determination of the effect of those events with respect to depth, velocity and inland penetration of inundation, ground acceleration etc. as affected by local topology.
  - Determination of the effect of such inundation on buildings and infrastructure.
  - Implementation of an affordable disaster reduction strategy depending on the importance of the structure or facility and the risk of loss of life.
  - Implementation of the disaster reduction strategy at the local community level.
- 

Further Prof. Narayana Explained :

### **Climate Change: Scientific Evidences**

- **Rainfall variations**
- **Change in rainy days**
- **Unusual floods**
- **CO2 variations**
- **Global warming – increase of temps**
- **Ice sheets melting –**  
(in polar regions, Alps, Himalayas)
- **Depletion of Ground Water**
  
- **Natural causes of climate change**
- **Anthropogenic causes of climate change**
- **Impact of climate change on the society**

***Prof.Naryana then explained UNFCCC, KYOTO PROTOCOL***

**The United Nations Framework Convention on Climate Change (UNFCCC)**

The Convention entered into force on 21 March 1994.

Convention sets an overall framework for inter-governmental efforts to tackle the challenge posed by climate change.

It recognizes the climate system as a shared resource, whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases.

The Convention has a membership of 192 countries.

Under the Convention, governments gather and share information on greenhouse gas emissions, national policies and best practices, launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries, and cooperate in preparing for adaptation to the impacts of climate change.

**Kyoto Protocol**

- an international agreement linked to the UNFCCC.

The major feature of the KP - it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. These amount to an average of 5% against 1990 levels over the five-year period 2008-2012.

Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity.

The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. 184 Parties of the Convention have ratified the Protocol to date.

***Importantly he explained Earth's climate history – Paleoclimatology, Earth's shifting Orbit.***

**Earth's climate history – Paleoclimatology:**

Sea-floor sediments, ice sheets, corals, cave formations, ancient trees, and Alpine & Himalayan glaciers all hold clues to past climates. Scientists have assembled a coherent picture of the Earth's climate history by combining data from all these sources.

Scientists learned that the Earth had gone through at least three or four ice ages. Noticing that the ice came and went cyclically, they began to query whether the ice ages were connected to variations in the Earth's orbit.

**The Earth's Shifting Orbit**

Three variables of the Earth's orbit – eccentricity, obliquity, and precession - affect global climate.



Changes in *eccentricity* (the amount the orbit diverges from a perfect circle) vary the distance of Earth from the Sun. Changes in *obliquity* (tilt of Earth's axis) vary the strength of the seasons. *Precession* (wobble in Earth's axis) varies the timing of the seasons (Milutin Milankovitch: *Orbital Variations*, 1900s).

***He also explained the concepts of Eccentricity, Earth's Axis of rotation etc.. variations and effects.***

**Eccentricity:** The Earth circles the Sun in a flat plane. It is as if the spinning Earth is also rolling around the edge of a giant, flat plate, with the Sun in the center. The shape of the Earth's orbit—the plate—changes from a nearly perfect circle to an oval shape on a 100,000-year cycle (eccentricity).

If you draw a line from the plate up through the Earth's North and South Poles—Earth's axis—the line would not rise straight up from the plate. Instead the axis is tilted, and the angle of the tilt varies between 22 and 24 degrees every 41,000 years.

**Earth's axis of rotation slowly moves and traces out the path of a cone in space**

Earth wobbles on its axis as it spins. Like the handle of a toy top that wobbles toward you and away from you as the toy winds down, the “handle” of the Earth, the axis, wobbles toward and away from the Sun over the span of 19,000 to 23,000 years (precession).

**These small variations in Earth-Sun geometry change show how much sunlight each hemisphere receives during the Earth's year-long trek around the Sun, where in the orbit (the time of year) the seasons occur, and how extreme the seasonal changes are.**

**Milutin Milankovitch's work culminated in the publication of *Mathematical Climatology and the Astronomical Theory of Climate Change* in 1930.**

***Lastly he explained about Glacial & Inter-glacial periods, fluctuations,***

**Glacial & Inter-glacial periods**

With glacial ice restricted to high latitudes and altitudes, Earth 125,000 years ago was in an interglacial period similar to the one occurring today. During the past 125,000 years, the Earth system went through an entire glacial-interglacial cycle. The most recent period of glaciation began ~ 120,000 years ago. Significant ice sheets developed and persisted over much of Canada and northern Eurasia.

The glacial period that peaked 21,500 years ago was only the most recent of five glacial periods in the last 450,000 years.

The Earth system has alternated between glacial and interglacial regimes for more than two million years, a period of time known as the Pleistocene. The duration and severity of the glacial periods increased during this period, particularly sharp change occurring between 900,000 and 600,000 years ago. Earth is currently within the most recent interglacial period, which started 11,700 years ago and is commonly known as the Holocene Epoch.

**Similar glacial –interglacial fluctuations are documented in many proxies.....**

- **Oxygen isotopic ratios in Foraminifera**
- **Calcium carbonate content in marine sediment**
- Sea surface temperature records
- Nutrient inventory of oceans
- **Productivity of the oceans**

**Ice cores drilled in Antarctic have preserved accurate records of past atmospheric temperature and carbon-dioxide!**

### **Industrial Revolution and Atmosphere**

The current concentrations of key greenhouse gases, and their rates of change, are unprecedented

*Very importantly Prof.Narayana explained the prominent signals of climate change, Global Warming.*

### **Three Prominent Signals of Climate Change :**

- Increase in global average temperatures
  - Rise in sea levels
  - Change in precipitation patterns
- All these convert in to signals of regional scale hydrologic change in terms of modifications in water availability, water evaporation, hydrologic extremes of floods and droughts, water quality, salinity intrusion in coastal aquifers, ground water recharge and other related phenomena.

### **Global Warming**

i. Rate of warming is double during last 50 years (Trenberth et al. 2007)

ii. Global sea-level changes - **past, present & future**

Synthesis Report for Policy Makers: Importantly Prof. Narayana presented

- Rising atmospheric temperature
- Rising sea level
- Reductions in NH snow cover oceans.. And upper atmosphere....

*Lastly he explained about Spatial Patterns, Climate change and Impact on Sea level in India.*

### **SPATIAL PATTERNS :**

Further various real time images he showcased of the changes in (a) summer monsoon rainfall (%) and (b) Annual mean surface air temperature (°C) for the period 2071-2100. With reference to the baseline of 1961-1990

**Climate Change Impact on Sea level in India :** Prof. Naryana the explained how Climate change is impacting Sea Level.

**DR.V.B. RAMANA MURTHY IFS  
DY.DIRECTOR  
A.P.FOREST ACADEMY &  
FORMER, MEMBER SECRETARY,  
ANDHRA PRADESH BIODIVERSITY  
BOARD**



**Dr.V.B. Ramana Murthy IFS  
A.P.Forest Academy**



Dr.Murthy explaining Bio-diversity of India according to diverse climatic zones i.e, arid zone, tropical zone, rain forests, etc





Dr.Murthy explaining Study of flora and fauna in your region, identification of climatic zone of your area



Participant expressing his views before Dr.Murthy



Year 2010 is  
Declared as  
**International  
Year of  
Biodiversity** by  
United Nations.  
Talk by  
Dr.Ramana  
Murthy Inspired  
the participants  
immensely

TOPICS COVERED
<ol style="list-style-type: none"><li>1. . Bio-diversity of India according to diverse climatic zones i.e, arid zone, tropical zone, rain forests, etc.</li><li>2. Study of flora and fauna in your region, identification of climatic zone of your area</li></ol>

# Biodiversity

• The variety of life on Earth, its biological diversity is commonly referred to as biodiversity. • The number of species of plants, animals, and microorganisms, the enormous diversity of genes in these species, the different ecosystems on the planet, such as deserts, rainforests and coral reefs are all part of a biologically diverse Earth. • Appropriate conservation and sustainable development strategies attempt to recognize this as being integral to any approach. • Almost all cultures have in some way or form recognized the importance that nature, and its biological diversity has had upon them and the need to maintain it. • Yet, power, greed and politics have affected the precarious balance.

## **Why Is Biodiversity Important? Who Cares?**

- Biodiversity boosts ecosystem productivity where each species, no matter how small, all have an important role to play.
- For example, a larger number of plant species means a greater variety of crops; greater species diversity ensures natural sustainability for all life forms; and healthy ecosystems can better withstand and recover from a variety of disasters.
- And so, while we dominate this planet, we still need to preserve the diversity in wildlife.

## **Loss of Biodiversity and Extinctions**

- It has long been feared that human activity is causing massive extinctions.
- Despite increased efforts at conservation, it has not been enough and biodiversity losses continue.

- The costs associated with deteriorating or vanishing ecosystems will be high. However, sustainable development and consumption would help avert ecological problems.

### **Climate Change affects Biodiversity**

- Rapid global warming can affect an ecosystem's chances to adapt naturally.
- The Arctic is very sensitive to climate change and already seeing lots of changes.
- Ocean biodiversity is already being affected as are other parts of the ecosystem.

**Climate Change and Global Warming** The climate is changing. The earth is warming up, and there is now overwhelming scientific consensus that it is happening, and human-induced. With global warming on the increase and species and their habitats on the decrease, chances for ecosystems to adapt naturally are diminishing. Many are agreed that climate change may be one of the greatest threats facing the planet.

### **Environmental Issues**

Environmental issues are also a major global issue. Humans depend on a sustainable and healthy environment, and yet we have damaged the environment in numerous ways. This section introduces other issues including biodiversity, climate change, animal and nature conservation, population, genetically modified food, sustainable development, and more.

### **CONCLUSIONS:**



- Climate change is a reality
- Indian agriculture is likely to suffer losses in long run due to heat, erratic weather, and decreased irrigation availability
- Adaptation strategies can help minimize negative impacts to some extent
- These need research and policy support

## AGENDA

- Biodiversity in arid, semi arid, humid, sub humid climatic conditions.
- Ficus tree can host/feed about 150 species during its calendar year.
- Rattans/canes presence.
- Red sanders occurrence.
- G.I.B.
- Jerdon's courser.

Biodiversity Defined as per the Biological Diversity Act 2002.

- BIOLOGICAL RESOURCES means plants, Animals, and microorganisms or parts thereof.
- The Biological Diversity Management committee (B.M.C.) shall promote conservation, sustainable utilisation and fair and equitable sharing of the usufructs arising out of the biological resources including traditional knowledge relating to the biological diversity sec 41(1).

Dried tree trunk

- Hole of tree creator

- tenant1. common myna
- tenant2. parakeet
- tenant 3. copper smith
- tenant 4. horn bill
- tenant 5.tree borne snake.

#### Mungari molaka

- **URGINEA INDICA | JANGALI PIAZ**

- Family: Cannabaceae

Genus: Cannabis

COMMON NAMES:-**ban piaz, kolikanda, rankanda , narivengayam**, ..etc

NATURE:-it is a bulbous plant, have bulb 4-14 cm, dull white or pale, ovoid.

FLOWER:-flowers are light brown in colour and in slender long bunches.

FRUITS:-fruits are 1.2-2 cm long ,narrowed on both ends: seeds are black.

#### Green India

##### Mission

- 5.4.means to achieve Mission targets
- 5.4.1. Strengthen the Local Community Institutions.
- Mission would strengthen grama sabhas as over arching institutions supported by thematic committees and user groups such as BIOIDIVERSITY MANAGEMENT COMMITTEES,etc.

### **B.M.C. s under R.O.F.R. Act**

- The B.M.C.s were empowered by the R.O.F.R. act that the intellectual property rights are to be protected across the generations and benefits are to be equitably shared among the stake holders.

### **Conservation initiatives**

- *Insitu* conservation initiatives – M.P.C.A.s and biological heritage sites such as Timmamarru manu- 800 years old ficus tree spread over an area of about 5 acres.
- Village spread is skewed.

The other great ficus trees are

1. Botanical garden Kolkatta

2. Adyar banyan tree in the Theosophical Society Chennai.

- Declaration of biological heritage sites

Pelicanries, heronries and other species related initiatives

Kongala chintapally of Khammam- villagers do not get any visitor who accepts the hospitality.

Veerapuram of Anantapur first judicial decision of A.P. High court of Judicature.

### **Exsitu conservation initiatives**

- Dolphin Conservation Society of Visakhapatnam first biodiversity park was declared.

- A.N.G.R.A. University has established Agri- biodiversity park as “one stop shop” for the plant breeders to plant wild relatives, farmers land races and farmers selections of agriculturally important crops.

### **Bio-piracy/biological prospecting of Plants.**

- Red sanders
- Sandal wood
- Gum karaya- Dr A.P.J. Abdul Kalam has popularised the success story of *Sterculia urens* -absorption ability of the heavy metal.

**Under this Dr.Murthy present his case law study of *Traditional Knowledge of Vempali (Tephrosia purpurea)***

**He gave Case study of Bio Piracy**

Bio-Piracy Case Study

- 1. Organism: *Traditional Knowledge \_\_\_\_\_ of Vempali (Tephrosia purpurea)*
- 2. Source: BMC of Kammarapally of Nizamabad District.
- 3. Complaint and Accused: Chairman BMC Kammarapally
- 4. Name of the Chairman:  
Dr. Sainath Prakash Chintha
- A. NRI Doctor of Boston bounced the cheque of Rs.100 Lakhs
- 5. Follow-up Action:
- BMC has resolved to lodge a complaint of looting of the Traditional Knowledge related Biological Resources and patenting the Traditional Knowledge.

Datura sps

- Datura is the plant revered by most of the hindus as one of the plants to be used in the ganesh chaturdhi festival.
- The Patent for the medicinal usage of the plant was obtained in 1993 by a scientist of C.S.I.R. for extraction of Atropine

#### Bio piracy of Animals.

- Gutti sapphire blue tarantula
- Araku ornamental spider
- Sea shells seized in Guntur
- Tiger rhinoceros and birds –every animal is aphrodisiac

BIO-PIRACY CASE STUDY – ONGOLE BULL : Under this Dr.Murthy present his case law study of ONGOLE BULL.

- Organism:  
*ONGOLE BULL*
- Source: BMC Ongole of Prakasham District.
- Complaint and Accused: Chairman BMC

#### CASE STUDY - STAR TOROTOISE :

- The smuggled Indian Star tortoises which were seized at Singapore airport and sent to the Nehru Zoological Park in Hyderabad.
- HYDERABAD AUG. 23. As many as 1,830 Star tortoises, smuggled from Chennai, were confiscated at the Singapore airport and later shifted to the Nehru Zoological

Park here. The tortoises would be rehabilitated in the wild after ascertaining their place of origin through a morphological analysis and DNA fingerprinting.

- The *Geochelone Elegans*, popularly known as Star tortoise, were seized from two Indians in June and July. After housing them at the Singapore zoo, the authorities there shifted them to Hyderabad via Chennai.

#### **Bio – Piracy Case Study : Tarantula Spider :**

- 1. Organism: *Tarantula Spider*
- 2. Source: *Tamarind trees on new Moon Day, Bamboo groves in full moon day at Araku*
- 3. Complaint: Chairman BMC of Araku of Visakapatnam District to the CJM court of Araku.
- 4. Trade off: \$ 150 to \$ 300 in Website
- 5. Follow up action:

1. BMC Complaint was followed to the concerned for action as per the Biological Diversity Act.

- 2. Indian embassy of Germany issued a Lookout notice.
- 3. Ambassador to Germany was not to issue visa to Dr.Clark Mark Baum Garten.

#### **BIOPIRACY OF MICROBIAL ORGANISMS:**

- *Bacillus thureungensis*
- 2. Source: *Black Cotton Soils of Mahanandi BMC of Kurnool*
- 3. Complaint: *Chairman BMC Mahanandi*
- 4. Name of the Chairman: *G.Thimma Reddy*

### **Bio-Piracy Case Study of microbes**

- 1. Organism: *Bacillus thureungensis*
  - 2. Source: *Black Cotton Soils of Mahanandi*                      *BMC of Kurnool*
  - 3. Complaint: *Chairman BMC Mahanandi*
  - 4. Name of the Chairman:  
*G.Thimma Reddy*
  - 5. Resolution Specification: Accession Fees of Rs 10/- per packet of genetically modified seeds produced.
  - Resulting in Rs 73/- Lakhs in 2006-07,                      and 137 Lakhs in 2008-09.
  - 6. Follow-up Action:
    - A.    MNC had opened regional growth    Development centre.
    - B.    School for children working in                      cotton fields.
    - C.    Infrastructure development in                      Mahanandi Panchayath.
- Effective conservation of the Biological resources by the B.M.C.members

### **BIO PIRACY AND I.P.R. INSTRUMENTS :**

- Biological patents-basmati, neem, soapnut, turmeric.
- Geographical indications- baganapalli mango (beneshan)
- Trade marks- sona masuri rice.
- Traditional Knowledge-T.K.D.L. initiative



- [www.tkdil.nic.in](http://www.tkdil.nic.in)

#### **MAHANANDI INITIATIVE :**

- Video recording of the traditional knowledge in the regional language
- Telugu speech recognition software reduces the oral to text (90% accuracy was claimed)
- translation of the telugu text to W.I.P.O. recognised languages to act as priorart.
- The T.K. will be part of “Peoples Biodiversity Register” of the B.M.C.

#### **“BIOINDIA BIOLOGICAL” INITIATIVE- [WWW.BIOINDIABIOLOGICAL](http://WWW.BIOINDIABIOLOGICAL)**

**CORPORATION:** BIB believes in conducting business in a manner that protects the Earth, conserves resources and does not compromise the ability of future generations to sustain. Our mission positions BIB as a catalyst for awareness. Associated with the National Biodiversity Authority (NBA), India; Andhra Pradesh State Biodiversity Board (APSBB). Our Neem has compiled with The Convention of Biodiversity of United Nations. We are encouraging Organic Agriculture; Associated with Organic Farmers for various Medicinal Herbs and Aromatic Plants.

#### **Wetlands**

- Mean summer temperature
- Mean annual precipitation
- Flooding

- Increased variability in the hydrological cycle leaving inland wetlands to dry out with lower species diversity
- Warming of 3 - 4°C. could eliminate 85% of all remaining wetlands

#### Coastal marshes

- Relative rate of sea-level rise, changes in hydrological balance
- Storm frequency and severity
- Habitat loss of estuaries and deltas, particularly where these are backed by agricultural or urban land, preventing natural retreat
- Implications on migratory species and their flyway patterns

#### Forests general

- Changes in rainfall, temperature and potential evapotranspiration.
- Increased frequency of fire and storms.
- Major changes in vegetation types, forests may disappear in certain areas at a rate faster than the potential rate of migration to, or re-growth in, new areas

#### Tropical Montane Forest

- Changes in degree of cloud cover versus and sunlight hours
- Hurricane frequency and severity
- Drought frequency and annual rainfall distribution
- Drying out and invasion or replacement of montane species by lower montane or non-montane species

#### Low-lying islands

- Relative sea-level rise
- Storm frequency and severity

- Loss of land area, seabird nesting colonies. Increased human demands on remaining terrestrial habitats

#### Arid and semi-arid areas

- Precipitation patterns
- Minimum winter temperatures
- With a few exceptions deserts are expected to become hotter and drier
- Desertification into sub-Saharan Africa and Central Asian Steppes
- Salinisation
- Loss of grassland
- Loss of arable land

#### Mangroves

- Relative rate of sea-level rise, changes in hydrological balance in estuarine systems
- Storm frequency and severity
- Decrease in extent as coastal zone becomes "squeezed" between sea and inland agriculture

Thanks for providing voice to speechless.

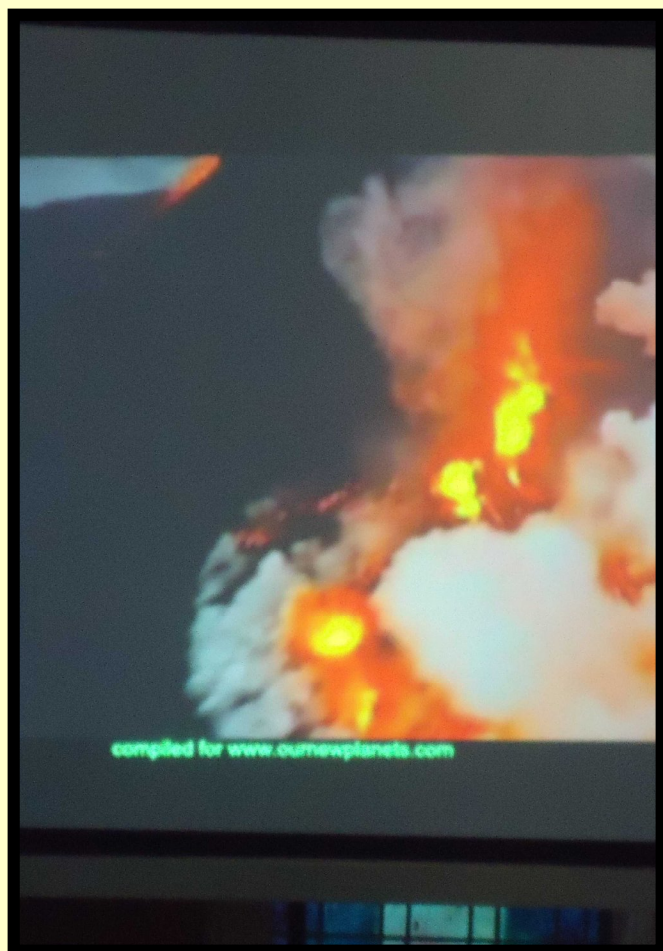
- Greetings on the eve of International Year of Biodiversity
- Theme biodiversity and development.

**N. SRI RAGHUNANDAN KUMAR  
GENERAL SECRETARY,  
PLANETARY SOCIETY, INDIA**

## SPECIALY COMPILED - AUDIO-VISUAL PRESENTATIONS



Real Time Audio-Visual of Smoke and ash billows from a volcano in Eyjafjallajokull, Iceland





## DEMONSTRATION : WHAT TO DO WHEN EARTH QUAKE STRIKES



While reiterating few points of Prof. Naryana's talk about Earth Quake –  
Mr.N.Sri Raghunandan Kumar Presenting a visual of Earth Quake



Before beginning the Demo Mr.Kumar asked Participants What  
will they do ? Will they run outside ?



Real video of Japanese students was students. Master sai demonstrating the  
same.





Compiled Audio-Visuals and other related information being explained.



Mr.N.Sri Raghunandan Kumar, General Secretary, Planetary Society, India during his Presentation. Different Posters, Audio-Visual Material can also be seen.



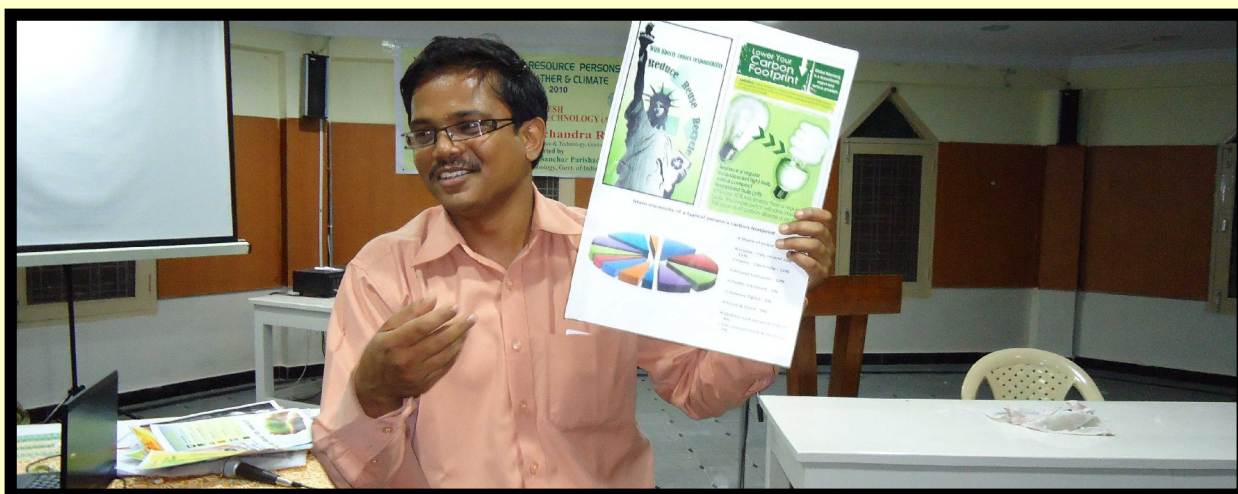
Mr.Kumar responding to various Questions/Doubts raised. While many of them were answered by mail after contacting the relevant topic expert.



## POSTER PRESENTATION



Specially prepared Posters (which can be used by participants in their schools) by the Society with APCOST support were demonstrated and distributed to participants



One of the Poster explaining Benefits of CFL Bulb compared to ordinary bulbs. Various stats also can be seen in the poster.

Mr.N.Sri Raghunandan Kumar begin his presentation saying “ We are yet to find out if any other planet beyond Mother Earth sustains life in any form. But, as of now Earth is our home; the most cozy and comfortable abode of the mankind, the other animals and plants species.”

He said Earth is full of excitement and surprises, is rich in diversity and colours. But we have plundered its resources, defiled the environment and used it as the garbage bin for ages now. Our self-esteem as the “Masters of the Universe” has received many setbacks after man-made calamities and disasters that have befallen us in recent times. We have realized our mistakes and taken corrective measures. Many more need to be taken. Next few decades in this 21<sup>st</sup> century will decide not only our love for Mother Earth, but also our own survival on it.

He explained Two hundred million years back when dinosaurs roamed around the earth, entire landmass of the earth was connected in one giant super-continent called PANGAEA. Later it broke and separated out, giving rise to the present continents. Changes have taken place not only in the geological formations; in biotic and abiotic worlds too changes have become the rule. Today, dinosaurs are extinct; so are millions of other animals and plants species. But with all that, which remains, human beings share this unique planet. There cannot be any concept of supremacy or dominance in this Earth. With 71% water and 29% land, this planet has created its environment in a highly balanced manner. Disturbing this balance would undoubtedly cause irreversible changes.

He said Earth is the third planet from the Sun at a distance of about 150 million kilometers. It takes 365.256 days for the Earth to travel around the Sun in its orbit and 23.9345 hours for the Earth to a complete rotation around its own axis. It has a diameter of 12,756 kilometers. We are blessed with the unique atmosphere which makes life possible. Oxygen in the atmosphere makes Earth the only planet in the universe to harbour life. Our planet's rapid spin and molten nickel-iron core gave rise to an extensive magnetic field, which, along with the atmosphere, shields us from nearly all harmful radiation coming from the Sun and other stars. Earth's atmosphere protects us from meteors, most of which burn up before they can strike the surface with calamity.

He pointed scientists all around the world have collected enormous information about Earth, its physical and chemical composition, diversity of life, besides all bio-geo-physical changes. The search for knowledge started more than 5000 years ago and it still is going on uninterrupted. Exploration of Earth is going on in various spatial scales. Earth gives the same kind of wonders and excitement from microscopic scale to the macroscopic studies of space, but with a great unifying effect. No single discipline or subject answers all questions coming to our minds. We need physics, chemistry, life sciences, mathematics & geometry, astronomy, philosophy, modern computers and information technology, everything to know about the wonders of this planet. Thus study of earth is holistic in approach; it brings the people and disciplines together; it demands objective details; it necessitates the synthesis of facts. **But more than anything else, this quest for knowledge promotes innovations, improvisations and discoveries.**

Keeping above words in mind Mr.Raghunandan Kumar presented specially compiled audio-visual content for the benefit of participants. He also demonstrated a drill for Prevention of life loss during earth quake etc... Importantly he presented various informative posters prepared /Compiled by Planetary Society, India. He presented real videos of recent natural events like volcano bursts in Iceland, tornado in orrisa etc..

# **GROUP DISCUSSION**



## GROUP DISCUSSION



One of the Participant making a point during Discussion



Participants can be seen exchanging views



VISIT  
TO  
ANDHRA PRADESH  
STATE REMOTE  
SENSING APPLICATION  
CENTER (APSRAC)

&

INDIAN  
METEOROLOGICAL  
DEPARTMENT (IMD),  
HYDERABAD

**FIELD VISIT  
TO  
ANDHRA PRADESH  
STATE REMOTE  
SENSING APPLICATION  
CENTER (APSRAC)**





Participants being explained Remote Sensing data  
Collected through satellites



Scientist explaining inside highly secure server room. Where  
he talked about various remote sending applications



Participants interacting with scientists of APSRAC





Participating taking close look of their district in state map. Excitement on the face can be noted. APCOST official Dr.C.V.R. Ramakrishna can be seen in the background beyond the computer



Scientist sharing his data from archives.

APSRAC VISIT COVERED
Study of remote sensing and its applications

Timings :

9<sup>th</sup> August 2010

10.30 to 12 a.m.

A.P. State Remote Sensing Application Centre (APSRAC) is one of the importantly center of Govt. of Andhra Pradesh. It is engaged in operation of remote sensing application activities. Its use of remote sensing data mandates wide spectrum of themes which include water resources, agriculture, soil and land degradation, mineral exploration, groundwater targeting, geomorphologic mapping, coastal and ocean resources monitoring, environment, ecology and forest mapping, land use and land cover mapping and urban area studies, large scale mapping, etc.

The chief activities of APSRAC are satellite data and aerial data reception, data processing, data dissemination, applications for providing value added services and training and distribution to the needs of State Government and local beneficiaries.

Data is majorly sourced from National Remote Sensing Center (NRSC). The acquired data are being processed in-house, churning out variety of data products for distribution among the user community. Apart from data supply, it has the capability to undertake projects in a variety of disciplines as when required by State Government.

APSRAC has organized training activities to train professionals, scientists as well as decision makers on Remote Sensing and GIS.

### **REMOTE SENSING:**

The visit begin with introduction Remote Sensing. The scientists at APSRAC explained that remote sensing is the small- or large-scale acquisition of information of an object or phenomenon, by the use of either recording or real-time sensing device(s) that are wireless, or not in physical or intimate contact with the object (such as by way of aircraft, spacecraft, satellite, buoy, or ship). In practice, remote sensing is the stand-off collection through the use of a variety of devices for gathering information on a given object or area.

Thus, Earth observation or weather satellite collection platforms, ocean and atmospheric observing weather buoy platforms, the monitoring of a parolee via an ultrasound identification system, Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), X-radiation (X-RAY) and space probes are all examples of remote sensing.

In modern usage, the term generally refers to the use of imaging sensor technologies including: instruments found in aircraft and spacecraft as well as those used in electrophysiology, and is distinct from other imaging-related fields such as medical imaging.

**Overview:**

Scientists at APSRAC center explained that there are two main types of remote sensing: passive remote sensing and active remote sensing. Passive sensors detect natural radiation that is emitted or reflected by the object or surrounding area being observed. Reflected sunlight is the most common source of radiation measured by passive sensors. Examples of passive remote sensors include film photography, infrared, charge-coupled devices, and radiometers. Active collection, on the other hand, emits energy in order to scan objects and areas whereupon a sensor then detects and measures the radiation that is reflected or backscattered from the target. RADAR is an example of active remote sensing where the time delay between emission and return is measured, establishing the location, height, speed and direction of an object.

Remote sensing makes it possible to collect data on dangerous or inaccessible areas. Remote sensing applications include monitoring deforestation in areas such as the Amazon Basin, glacial features in Arctic and Antarctic regions, and depth sounding of coastal and ocean depths. Military collection during the cold war made use of stand-off collection of data about dangerous border areas. Remote sensing also replaces costly and slow data collection on the ground, ensuring in the process that areas or objects are not disturbed.

Orbital platforms collect and transmit data from different parts of the electromagnetic spectrum, which in conjunction with larger scale aerial or ground-based sensing and analysis, provides researchers with enough information to monitor trends such as El Niño and other natural long and short term phenomena. Other uses include different areas of the earth sciences such as natural resource management, agricultural fields such as land usage and conservation, and national security and overhead, ground-based and stand-off collection on border areas.

**Data acquisition techniques :** The basis for multispectral collection and analysis is that of examined areas or objects that reflect or emit radiation that stand out from surrounding areas.

**Applications of remote sensing data**

\* Conventional radar is mostly associated with aerial traffic control, early warning, and certain large scale meteorological data. Doppler radar is used by local law enforcements' monitoring of speed limits and in enhanced meteorological collection such as wind speed and direction within weather systems. Other types of active collection includes plasmas in the ionosphere).

Interferometric synthetic aperture radar is used to produce precise digital elevation models of large scale terrain (See RADARSAT, TerraSAR-X, Magellan).

- \* Laser and radar altimeters on satellites have provided a wide range of data. By measuring the bulges of water caused by gravity, they map features on the seafloor to a resolution of a mile or so. By measuring the height and wave-length of ocean waves, the altimeters measure wind speeds and direction, and surface ocean currents and directions.

- \* Light detection and ranging (LIDAR) is well known in examples of weapon ranging, laser illuminated homing of projectiles. LIDAR is used to detect and measure the concentration of various chemicals in the atmosphere, while airborne LIDAR can be used to measure heights of objects and features on the ground more accurately than with radar technology. Vegetation remote sensing is a principal application of LIDAR.

- \* Radiometers and photometers are the most common instrument in use, collecting reflected and emitted radiation in a wide range of frequencies. The most common are visible and infrared sensors, followed by microwave, gamma ray and rarely, ultraviolet. They may also be used to detect the emission spectra of various chemicals, providing data on chemical concentrations in the atmosphere.

- \* Stereographic pairs of aerial photographs have often been used to make topographic maps by imagery and terrain analysts in trafficability and highway departments for potential routes.

- \* Simultaneous multi-spectral platforms such as Landsat have been in use since the 70's. These thematic mappers take images in multiple wavelengths of electro-magnetic radiation (multi-spectral) and are usually found on Earth observation satellites, including (for example) the Landsat program or the IKONOS satellite. Maps of land cover and land use from thematic mapping can be used to prospect for minerals, detect or monitor land usage, deforestation, and examine the health of indigenous plants and crops, including entire farming regions or forests.

- \* Within the scope of the combat against desertification, remote sensing allows to follow-up and monitor risk areas in the long term, to determine desertification factors, to support decision-makers in defining relevant measures of environmental management, and to assess their impacts

**Geodetic :** Overhead geodetic collection was first used in aerial submarine detection and gravitational data used in military maps. This data revealed minute perturbations in the Earth's gravitational field (geodesy) that may be used to determine changes in the mass distribution of the Earth, which in turn may be used for geological or hydrological studies.

**Acoustic and near-acoustic :**

- \* Sonar: passive sonar, listening for the sound made by another object (a vessel, a whale etc); active sonar, emitting pulses of sounds and listening for echoes, used for detecting, ranging and measurements of underwater objects and terrain.

- \* Seismograms taken at different locations can locate and measure earthquakes (after they occur) by comparing the relative intensity and precise timing.

To coordinate a series of large-scale observations, most sensing systems depend on the following: platform location, what time it is, and the rotation and orientation of the sensor. High-end instruments now often use positional information from satellite navigation systems. The rotation and orientation is often provided within a degree or two with electronic compasses. Compasses can measure not just azimuth (i. e. degrees to magnetic north), but also altitude (degrees above the horizon), since the magnetic field curves into the Earth at different angles at different latitudes. More exact orientations require gyroscopic-aided orientation, periodically realigned by different methods including navigation from stars or known benchmarks.

Resolution impacts collection and is best explained with the following relationship: less resolution=less detail & larger coverage, More resolution=more detail, less coverage. The skilled management of collection results in cost-effective collection and avoid situations such as the use of multiple high resolution data which tends to clog transmission and storage infrastructure.

**Data processing :**Generally speaking, remote sensing works on the principle of the inverse problem. While the object or phenomenon of interest (the state) may not be directly measured, there exists some other variable that can be detected and measured (the observation), which may be related to the object of interest through the use of a data-derived computer model. The common analogy given to describe this is trying to determine the type of animal from its footprints. For example, while it is impossible to directly measure temperatures in the upper atmosphere, it is possible to measure the spectral emissions from a known chemical species (such as carbon dioxide) in that region. The frequency of the emission may then be related to the temperature in that region via various thermodynamic relations.

The quality of remote sensing data consists of its spatial, spectral, radiometric and temporal resolutions.

### **Spatial resolution**

The size of a pixel that is recorded in a raster image – typically pixels may correspond to square areas ranging in side length from 1 to 1,000 metres (3.3 to 3,300 ft).

### **Spectral resolution**

The wavelength width of the different frequency bands recorded – usually, this is related to the number of frequency bands recorded by the platform. Current Landsat collection is that of seven bands, including several in the infra-red spectrum, ranging from a spectral resolution of 0.07 to 2.1  $\mu\text{m}$ . The Hyperion sensor on Earth Observing-1 resolves 220 bands from 0.4 to 2.5  $\mu\text{m}$ , with a spectral resolution of 0.10 to 0.11  $\mu\text{m}$  per band.

### **Radiometric resolution**

The number of different intensities of radiation the sensor is able to distinguish. Typically, this ranges from 8 to 14 bits, corresponding to 256 levels of the gray scale and up to 16,384 intensities or "shades" of colour, in each band. It also depends on the instrument noise.

### **Temporal resolution**

The frequency of flyovers by the satellite or plane, and is only relevant in time-series studies or those requiring an averaged or mosaic image as in deforesting monitoring. This was first used by the intelligence community where repeated coverage revealed changes in infrastructure, the deployment of units or the modification/introduction of equipment. Cloud cover over a given area or object makes it necessary to repeat the collection of said location.

In order to create sensor-based maps, most remote sensing systems expect to extrapolate sensor data in relation to a reference point including distances between known points on the ground. This depends on the type of sensor used. For example, in conventional photographs, distances are accurate in the center of the image, with the distortion of measurements increasing the farther you get from the center. Another factor is that of the platen against which the film is pressed can cause severe errors when photographs are used to measure ground distances. The step in which this problem is resolved is called georeferencing, and involves computer-aided matching up of points in the image (typically 30 or more points per image) which is extrapolated with the use of an established benchmark, "warping" the image to produce accurate spatial data. As of the early 1990s, most satellite images are sold fully georeferenced.

In addition, images may need to be **radiometrically** and **atmospherically** corrected.



## **NEED OF REMOTE SENSING APPLICATIONS:**

**1. Agriculture :** Agricultural is the backbone of Indian economy, providing livelihood to about 67.0 per cent of the population and contributing approximately 35.0 per cent to the Gross National Product. Food grain production has increased from 51 millions tons in 1951 to 230.67 million tons in 2007-08. On the other end, the Indian population crossed the billion mark and needs around 250 million tons of food grains and calling for efficient agricultural management involving appropriate application of production and conservation practices for development of land and water resources on a sustainable basis. The remarkable developments in space borne remote sensing (RS) technology and its applications during the last three decades have firmly established its immense potential for mapping and monitoring of various natural resources. The satellite data at regular temporal interval enables monitoring of the natural resources for their effective management. The science of remote sensing of agricultural crops along with the capabilities of the remote sensing technology in providing information about the spatial distribution and extent and inter seasonal variations in cropping patterns, cropping systems analyses and interface with the agricultural drought assessment overview was provided.

**2. Land Use and Land Cover Analysis:** Economic development and population growth have triggered rapid changes to Earth's land cover over the last two centuries, and there is every indication that the pace of these changes will accelerate in the future. These rapid changes are superposed on long-term dynamics associated with climate variability. Land cover change can affect the ability of the land to sustain human activities through the provision of multiple ecosystem services and because the resultant economic activities cause feedbacks affecting climate and other facets of global change. Accordingly, systematic assessments of Earth's land cover must be repeated, at a frequency that permits monitoring of both long-term trends as well as interannual variability, and at a level of spatial detail to allow the study of human-induced changes.

LCLU Mapping i.e. "land cover (LC)" and "land use (LU)" Mapping is great tool.

**3. Forest and Vegetation :** Forests are the natural resource, which provide mankind with numerous benefits both in goods and services. Managing this important resource base both spatially as well as temporally dynamic, can be a daunting task without the utilization of proper spatial tool. Space technology has immense influence in the decision-making processes especially in areas like forest resource management. Remote sensing as a tool has facilitated systematic and hierarchical approach of forest resources assessment and its monitoring using sensors of different spatial and spectral capabilities, the characterization, quantification and monitoring including specific efforts

towards understanding the structure, composition and function of different natural habitats/ecosystems. These studies have provided key inputs for the regulation of the impact of developmental activities and to sustain the delivery of natural ecosystem goods and services. Forest resource assessment in India is being carried out in different levels e.g., bi-annual forest cover mapping using satellite remote sensed data.

With the availability of basic spatial coarse scale databases for important ecosystems, efforts have been made for understanding ecosystems structure and processes.

**4. Soils and Land Degradation:** The soil is a life supporting system upon which human beings have been dependent from the dawn of the civilization. Therefore, comprehensive information on soil resources, its potential / limitations / capabilities, is required for a variety of purposes such as command area development, soil conservation in catchment areas, sustainable agriculture, watershed management, reclamation of degraded lands etc. In this context, characterization and mapping of different types of soils, developing rational / scientific criteria for land evaluation and interpretation of soils for multifarious land uses attains greater importance.

Remote sensing technology has been successfully used in studying the various aspects of soils in spatial and temporal domain. The data obtainable from the sensors placed in a satellite or aircraft or ground level could be interpreted as a function of soil properties. Therefore, spectral reflectance of soils plays an important role in extracting information on different types of soils and land degradation. The techniques make use of data obtained from different regions of electromagnetic spectrum viz., visible, infrared, thermal and microwave regions.

**5. Urban and Regional Planning:** Expansion of urban area due to increase in population and migration from rural areas and the impact is bound to have on Urban areas in terms of infrastructure, environment, water supply and other vital resources. For organized way of planning and monitoring the implementation of physical urban and regional plans high-resolution satellite imagery is the potential solution. Remote Sensing data is being widely used for urban and regional planning, infrastructure planning mainly telecommunication and transport network planning, highway development, accessibility to market area development in terms of catchment and population built-up area density, etc. With remote sensing it is possible to identify urban growth, which falls out side the formal planning control and remedial measures can be taken timely to provide necessary basic infrastructure to improve health and hygiene. Remote Sensing and GIS technique combined together facilitate the planners, in

making decisions, for general public and investors to have relevant data for their use in minimum time.

**6. Water Resources Management:** Water is a key driver of economic and social development and one of the fundamental elements in sustaining the integrity of the natural environment. It is the major renewable resource amongst the various natural resources. Water being an indispensable constituent for all life supporting processes, its assessment, conservation, development and management is of great concern for all those who manage, facilitate and utilize. Issues related to water resources development and management are not in isolation but are inter-related with other human activities. The issues involved range from those of basic human well-being (food, security and health), economic development (industry and energy) and preservation of natural ecosystems on which ultimately we all exist and sustain.

Measurements from satellite remote sensing provide a means of observing and quantifying land and hydrological variables over geographic space and support their temporal description. Remote sensing instruments capture upwelling electromagnetic radiation from earth surface features which is either reflected or emitted. The former is reflected solar radiation and the latter is in thermal infrared and microwave portions of electro-magnetic spectrum. Active microwave radars obtain reflected/returned microwave signals. The reflected solar energy is used for mapping land & water resources like land use, land cover, forests, snow & glaciers, surface water features, geologic & geomorphologic features, water quality, etc. The thermal emission in the infrared is used for surface temperature, energy fluxes and microwave for soil moisture, snow & glacier, flood, etc.

**7. Geological Mapping** Images derived from multispectral sensors showed tremendous potential as an important source of application in various branches of geology- specially in geomorphology, structure and lithological mapping. These maps proved useful in different applications like Geoenvironmental appraisal projects, mineral exploration projects, geotechnical projects. But, it is to understand remote sensing images will be of little use for geological mapping if terrain is covered with forest, soil or other land use cover.

**8. Groundwater:** The distribution of groundwater is not uniform throughout the country. The spatio-temporal variations in rainfall and regional/local differences in geology and geomorphology have led to uneven distribution of groundwater in different regions across the country. Unplanned and haphazard development of groundwater in some areas has further compounded the problem and has led to a

sharp decline in groundwater levels. As a result, a large number of shallow wells have gone dry, resulting in a huge loss and shortage of drinking water in 20 to 25% of the habitation in the country.

Timely and reliable information on the occurrence and movement of groundwater is a prerequisite for meeting its growing demand for drinking, domestic and industrial sector. Being a sub-surface feature, the detection of groundwater relies heavily on the controlling factors, namely lithology, geomorphology, structures and precipitation, run-off, surface water and the extent of irrigated lands that control its occurrence and movement. Spaceborne spectral measurements hold a great promise in providing such information in timely, reliable and cost-effective manner

**9.Oceans :** Oceanography is the systematic scientific study of the Earth's oceans with the goal of understanding its processes and phenomena. Such a study requires an integrated view of the oceans and their relationships with other aspects of the Earth's overall environment. Surface of the earth is 70.8% water-covered. In the zonal direction, there is no land between 85-90 degrees N and between 55-60 degrees S. At meridional direction, 45-70N, there is more land than water and 70-90 S there is only land (Antarctica).

**10. Cyclones:** A cyclone is a low pressure area in the atmosphere in which winds spiral upward. A cyclone can cover an area as large as half of the United States. All cyclones are characterized by: (1) low pressure at the centre, and (2) winds spiraling toward the center. The direction of the spiral is unique because in the northern hemisphere the winds blow counter-clockwise and in the southern hemisphere they blow clockwise

**Other areas of application for remote sensing are:** Atmosphere, Flood Disaster Management, Agricultural Drought Monitoring and Assessment, Landslides, Earthquake and Active Faults , Forest Fire Monitoring

**VISIT  
To  
Indian  
Meteorological  
Department  
(IMD)**



**METEOROLOGICAL CENTRE, HYDERABAD**



**New Doppler Weather Radar Facility**



**Another view of the center**



Before participants can see the facilities a Brief demonstration and talk was conducted by the scientists of IMD at Conference Hall in the IMD Campus.





Official of the IMD with Weather Kit . **Aneroid barometer** can also be seen in the picture.



Participants listening to the IMD official's presentations

Participants aptly listening to the officials at the center Conference hall.







Various instruments on dais being taken out from weather kit



Participants working & Learning the working of **aneroid barometer** under the guidance of IMD official



Participants divided into different groups interacting with IMD official



Participants seriously engrossed and working on a instrument





Resource person explaining various instruments Cup Anemometer, Dew Guage, Hygrometer, Thermometer, PH meter



Resource Person explaining **Maximum Minimum Thermometer** thermo meter how the temperatures are recorded. Participant discussing in the group







Functioning of Rain gauge being explained



Participants interacting with resource persons



Participants aptly listening to demo of instruments



A participant asking question





Participant taking a snap with Anemometer



After being exposed to instruments in Weather Kit. Participants are out of the class in the field to have closer view of real instruments and their working.



Participants having hands on experience with Wind Vane to understand direction of wind



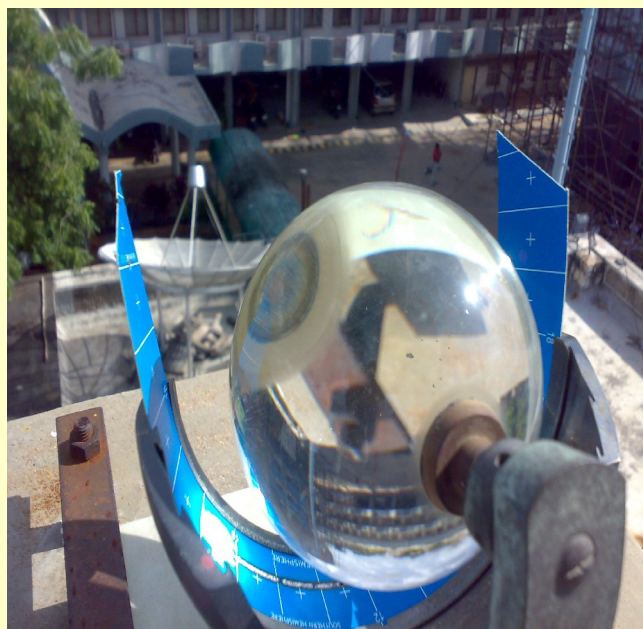


Participant applying what is learnt in the class and taking notes



Four Different instruments and Clouds can be seen in this picture





Participants being taken to on ground facilities of the center for explanation of instruments



**Participants with Weather balloon**



Clouds in the background of the two instruments

## IMD VISIT COVERED

1. Understand the usage and functioning of simple gadgets for measuring common weather parameters like

\*Cup anemometer—To measure wind velocity

\* Dew Gauge—To measure dew in the field

Barometer—To measure atmosphere pressure

\* Hygrometer—To measure humidity of air

\*Thermometer—To measure atmospheric temperature, max, min, average wet & dry bulb,

Snowfall and Rain gauge

\* PH meter, Acidity of rain

**Note :** *Practical sessions*

*Wind direction*

2. Visit to nearby meteorological centre

Understanding and interpretation of weather data

Timings :

9<sup>th</sup> August, 2010 - 2p.m. to 5 p.m.



## **FIELD EXPOSURE VISITS TO WEATHER MONITORING LAB OR STATIONS**

Under IMD several agricultural meteorological observatories have been established, that compile data, conduct research to weather parameters issue advisories with regard to weather parameters for analyzing and determining seasonal and cyclic variations, trend analysis etc. Visit to such stations and other institutions where data is gathered compiled, processed etc., will create better understanding and awareness amongst various target groups about weather, climate and hazards, etc. and their scientific principles. Students may appreciate scientists who are dedicated to climate study and chose this as a career.

**INTRODUCTION TO THE KIT :** The kit contains the activities most of which can be performed using items of the kit. However some activities may not require kit items as these are Based on the learners own experiences. Wherein the participants were suggested they may do additional activities as well if interested.

Media and materials required to perform the activities are also suggested in the activity book provided to each participant. Most of the activities are followed by extension activities in the form of project work, field trips, group discussion, collection etc...

## **WEATHER AND CLIMATE STUDY INSTRUMENTS INSIDE THE KIT**

1. MAXIMUM AND MINIMUM THEROMETER
2. WET AND DRY THERMOMETER
3. RAIN GUAGE
4. WIND VANE
5. ANEMOMETER
6. ANEROID BAROMETER
7. CLOUD CARDS

### **MAXIMUM MINIMUM THERMOMETER FOR MEASUREMENT OF MAXIMUM AND MINIMUM TEMPERATURE:**

The objective of this instrument is to determine maximum and minimum temperature of air. This thermometer uses expansion of liquid (mercury and alcohol) with the rise in temperature to record maximum and minimum temperature. When the temperature rises, the alcohol inside the bulb rises and pushes the mercury column in U tube and the mercury level rises. Conversely, when the temperature drops, the mercury level falls. Expansion or contraction of the fluid in the left side bulb causes

the movement of the mercury column. Consequently, one or the other steel bars is pushed forward by the mercury and left in the extreme position reached. Thus, the lower end of steel bar in the right limb indicates in the maximum temperature and the lower end of the steel bar in the left limb indicates the minimum temperature.

**RAIN GUAGE FOR MEASUREMENT OF RAIN FALL :** The objective of this instrument is to determine rainfall. It is the total amount of rain fall at a particular place within 24 hours. It is measured in terms of millimeter(mm). this means that if the rain fall at a particular place stands there without seepage in the ground and evaporation then the total standing water is the measure of the rain fall in millimeters. It is measured by a gadget called as a rain gauge.

**WET & DRY THERMOMETER FOR MEASUREMENT OF RELATIVE HUMIDITY :**

The objective of this instrument is to determine the relative humidity. Humidity is the amount of water vapour present in the air at any given time. From the standpoint of meteorological evaluation the absolute amount of water vapor present in the air is not so important as the capacity of the air to accept more water vapor. This is measured in terms of Relative Humidity. At zero relative humidity , the air posses maximum water vapor absorbing capacity. When air is saturated with water vapour, the relative humidity is 100 %.

The relative humidity is the percentage of actual water vapour present in the air and the total amount of water vapour that the air can hold at the same temperature and pressure.

Thus R.H. = Actual Water Vapour present

$$\frac{\text{-----}}{\text{Saturated water vapour at the temperature}} \times 100$$

In the conventional weather chart, the humidity is recorded at 8 a.m. and 5 p.m. every day.

**WIND VANE FOR DETERMINATION OF WIND DIRECTION:** The objective of this instrument is to determine the wind direction. The wind direction is normally observed in eight directions which are describe in the figure of the booklet. There are made further divisions between the two directions to get more accurate directions. The arrow will point to the direction the wind is blowing front so, if it is pointing to the east , it means the wind is coming from the east.

**THREE CUP ANEMOMETER FOR MEASUREMENT OF WIND VELOCITY:** The objective of this instrument is to determine wind velocity. Wind velocity can be easily assessed by a scale propounded by Rear Admiral Francis Beaufort in 1805. The Beaufort Wind scale has been classed in thirteen Beaufort numbers i.e. 0-12. the scale has been formulated on the basis of the effects observed on the sea and on the land.

Cup anemometers are conventionally used for wind speed measurements in meteorological stations. The air flow in any horizontal direction turns the cups in a manner that is proportional to the wind speed. The counting the turns of the cups over a definite time period provides the average wind speed for a wide range of speeds varying with time. The wind velocity is measured by anemometer in kilometers per hour.

**ANEROID BAROMETER FOR MEASUREMENT OF ATMOSPHERIC PRESSURE:**

The objective of this instrument is to measure atmospheric (air) pressure. Atmospheric pressure is the weight of the column of air above the earth surface per unit area. Therefore, it will depend on where the barometer has been placed. If the place of keeping the barometer at the sea level or 200 meters above or 1800 meters above the sea level. The barometer can be calibrated and adjusted to sea level pressure preferably on a clear and calm day when the pressure will not change rapidly or vary much from one place to another.

**IDENTIFICATION OF TYPES OF CLOUDS – through picture postcards :**

A simple method of categorizing clouds is

- \* stratiform
- \* Cumuliform
- \* the former category usually spreads over a large area, is relatively smaller in thickness, consists of small drops or particles, and have very small up or downward air motion within them.

The cumuliform types are smaller, discrete can have larger thickness and larger growth and hence vertical velocities. Because of the discrete character, there will be large variation in the rainfall from one point to another.

Also clouds are classified according to the height of the base of the clouds as

- I. LOW CLOUDS :
  - a. Stratus
  - b. Stratocumulus

## II. MIDDLE CLOUDS

- a. Altostratus
- b. Altocumulus

## III. HIGH CLOUDS

- a. Cirrus
- b. Cirrocumulus
- c. Cirrostratus

## IV. CLOUDS WITH VERTICAL DEVELOPMENT

- a. Cumulus
- b. Cumulonimbus

**WEATHER INSTRUMENT SHELTER: STEVENSON SCREEN :** A Stevenson screen or instrument shelter is an enclosure to shield meteorological instruments against precipitation and direct heat radiation from outside sources, while still allowing air to circulate freely around them. It forms part of a standard weather station. The Stevenson screen holds instruments that may include thermometers (ordinary, maximum/minimum), a hygrometer, a psychrometer, a dew cell, a barometer and a thermograph. Stevenson screens may also be known as a cotton region shelter, an instrument shelter, a thermometer shelter, a thermo screen or a thermometer screen. Its purpose is to provide a standardized environment in which to measure temperature, humidity, dew point and atmospheric pressure.

**SITE SELECTION AND INSTRUMENT SET UP :** Choosing the location for the weather and climate study site and correctly setting up rain gauge and instrument shelter are critical to the successful implementation of weather monitoring investigation. As the measurements are taken frequently, therefore, the place should not be too far so that the students can get to the site and return back in a shorter time.

The ideal site for taking atmospheric measurements is open, away from trees, buildings and other structures. the open area helps because nothing blocks precipitation, air is free to flow around the instruments, heat from individual buildings doesn't affect the data significantly and most of the sky can be seen. In choosing the site, some compromise may sometimes be necessary between the ideal for scientific, observations and the logistical constraints of the school grounds and their surroundings.

## **History:**

**Ancient Beginnings :** The beginnings of meteorology in India can be traced to ancient times. Early philosophical writings of the 3000 B.C. era, such as the Upanishadas, contain serious discussion about the processes of cloud formation and rain and the seasonal cycles caused by the movement of earth round the sun. Varahamihira's classical work, the Brihatsamhita, written around 500 A.D., provides a clear evidence that a deep knowledge of atmospheric processes existed even in those times. It was understood that rains come from the sun (*Adityat Jayate Vrishti*) and that good rainfall in the rainy season was the key to bountiful agriculture and food for the people. Kautilya's Arthashastra contains records of scientific measurements of rainfall and its application to the country's revenue and relief work. Kalidasa in his epic, 'Meghdoot', written around the seventh century, even mentions the date of onset of the monsoon over central India and traces the path of the monsoon clouds.

### **Mandate of IMD :**

- To take meteorological observations and to provide current and forecast meteorological information for optimum operation of weather-sensitive activities like agriculture, irrigation, shipping, aviation, offshore oil explorations, etc.
- To warn against severe weather phenomena like tropical cyclones, norwesters, duststorms, heavy rains and snow, cold and heat waves, etc., which cause destruction of life and property.
- To provide meteorological statistics required for agriculture, water resource management, industries, oil exploration and other nation-building activities.
- To conduct and promote research in meteorology and allied disciplines.
- To detect and locate earthquakes and to evaluate seismicity in different parts of the country for development projects.

## **Organisation**

The Director General of Meteorology is the Head of the India Meteorological Department, with headquarters at New Delhi. There are 4 Additional Directors General at New Delhi and 1 at Pune. There are 20 Deputy Directors General of whom 10 are at New Delhi.

For the convenience of administrative and technical control, there are 6 Regional Meteorological Centres, each under a Deputy Director General with headquarters at Mumbai, Chennai, New Delhi, Calcutta, Nagpur and Guwahati. Under the administrative control of Deputy Director General, there are different types of operational units such as Meteorological Centres at state capitals, Forecasting Offices, Agrometeorological Advisory Service Centres, Flood Meteorological Offices, Area Cyclone Warning Centres and Cyclone Warning Centres.

In addition, there are separate Divisions to deal with specialised subjects. They are: -

- Agricultural Meteorology , Civil Aviation, Climatology, ,Hydrometeorology, Instrumentation, Meteorological Telecommunication , Regional Specialised Meteorological Centre , Positional Astronomy , Satellite Meteorology , Seismology ,Training. At present IMD is under the Ministry of Earth Sciences (MoES).

**MAJOR ACTIVITIES OF IMD :** The India meteorological department maintains a countrywide network of observational stations from where weather reports are received at Pune through the Regional Telecommunication Hub (rth) based at New Delhi. With the help of these reports and other observations from the globe, the Pune office issues the All India Daily Weather Bulletin and Weather Forecasts for the entire country

For improving the accuracy of cyclone warnings to ports and coastal areas, the department has set up Cyclone Warning Radars along the east coast at Calcutta, Paradeep, Vishakhapatnam, Machilipatnam, Madras and Karaikal and along the west coast at Bhuj, Bombay, Goa and Kochi. These radars can detect and follow cyclones 400 km off the coast. There are 3 Area Cyclone Warning Centers at Calcutta, Madras and Bombay and 3 Cyclone Warning Centres at Vishakhapatnam, Bhubaneshwar and Ahmedabad. The Cyclone Warning and Research Centre at Madras conducts research on cyclones. The complete cyclone warning work is supervised and co-ordinated on real time basis by the Weather Central in the Office of DDGM (WF), Pune. A Cyclone Warning Division at HQrs, has been set up to co-ordinate and supervise the totality of cyclone warning programme in the country. Information received at Pune from the INSAT and Polar Orbiting Satellites of USA and USSR are utilised particularly when cyclones are in the ocean areas beyond the range of the radars. The INSAT system is also used to activate the Disaster Warning System (DWS) network along the coast whenever a tropical cyclone is predicted to strike a district. This unique system of disseminating weather warning has won handsome public appreciation.

As a responsibility to the International Communities under WMO/ESCAP Panel of tropical cyclones, advisories are issued by Regional Specialised Meteorological Centre of World Meteorological Organisation at New Delhi for the panel member countries during topical cyclones in the Bay of Bengal and the Arabian sea.

The most important weather phenomena are the Monsoons. The forecast about the arrival and day to day rainfall activity and the withdrawal of the Monsoon are done from this office at Pune. The Weather Central also prepares and issues the Indian Daily Weather Report, Weekly Weather Report Monsoon Summary and Storm Accounts.

An Indian Ocean and Southern Hemispheric Analysis Centre (INOSHAC) was set up at Pune in 1966. INOSHAC is issuing fleet forecasts and other bulletins for the activities over Indian Ocean in the Southern Hemisphere.

About 60 years ago in April 1929 to be exact, an Aviation Weather Service was set up in India to serve the earliest commercial flights, notably the airmail flights between England and India. Since then Aviation has soared higher and faster and the demand on meteorological department has increased many fold. This office co-ordinates all the Aviation services rendered by different units of the department. Verification of aviation forecasts and warnings are monitored by this unit to keep up the efficiency of the forecast service and to take corrective measures whenever needed. The Area Forecast Centre at New Delhi is responsible for the preparation of prognostic charts for aviation from Middle-East to South-east Asia for use in National and International Aviation Meteorological Offices.

The meteorological support to the marine activities like Naval, Mercantile and Fishing are provided by the India Meteorological Department. Recruitment of Indian Voluntary Observing Fleet (IVOF), supply of instruments to ships and collection of marine data are co-ordinated by this office at Pune. At present there are 228 ships under IVOF Scheme. In view of establishment of Coast Earth Station (CES) at Arvi (near New Bombay) there is a proposal to broadcast sea area bulletins via International Maritime Satellite (INMARSAT) under Global Maritime Distress Safety System (GMDSS).

A large number of persons employed in the department are engaged in various activities. All these people are trained at Pune for performing their assigned duties efficiently. A specially



designed training course for directly recruited Group-A Meteorologists came into effect from 1980 onwards. The facilities for meteorological training at Pune are utilised by the personnel from Defence, Coast Guard, Etc. Candidates nominated by the Meteorological services of other countries are given training here..

The problems of weather forecasting are closely linked with the understanding of atmospheric processes, and for that Research and Investigation on technique development provide the necessary background. The investigation and Development Unit carries out research for developing new techniques in weather forecasting.

The non-aviation forecasts issued by all the forecasting offices of the department are verified and suitable instructions for the improvement are issued from this office. The department is rendering assistance on meteorological aspects in the field of hydrology, water management and multi-purpose river valley projects. Ten Flood Meteorological Offices are functioning for Flood Forecast and Flood Control Services for the main rivers of the country mainly in the north and northeast.

IMD'S WEATHER FORECASTING SET-UP : Weather forecasting is a very important activity of IMD and it caters to a wide spectrum of user requirements ranging from agriculture to aviation. Short range forecasting involves prediction of weather conditions at any given place two days in advance, whereas in long range forecasting, rainfall for the country as a whole is predicted before the commencement of the monsoon season.

IMD provides very comprehensive forecasting services for aviation, shipping, fisheries, agriculture, flood forecasting, cyclone warning and many other special users besides forecasts for the general public. For this purpose, IMD has forecasting offices at its 6 Regional Meteorological Centres and Meteorological Centres at the State capitals. In addition it has two major forecasting centres at New Delhi and Pune. The Northern Hemispheric Analysis Centre at New Delhi serves as a high-level interface between IMD and the various government agencies and it provides inputs to the electronic and print media. It also functions as a Regional Specialised Meteorological Centre under the WMO system and executes much wider responsibilities towards other neighbouring countries. The Indian Ocean and Southern Hemispheric Analysis Centre is located at Pune. The Office of the Deputy Director General of

Meteorology (Weather Forecasting) and the "Weather Central" at Pune coordinate the weather forecasting activities of IMD, particularly in times of events like tropical cyclones.

Cyclone warnings, bulletins for fishermen and bulletins for ships in the seas, are issued by IMD's Area Cyclone Warning Centres at Chennai, Calcutta and Mumbai and Cyclone Warning Centres at Ahmedabad, Bhubaneshwar and Visakhapatnam.

Agrometeorological Advisory Bulletins for farmers are issued by 17 IMD Centres in various states. They also issue Farmers Weather Bulletins.

IMD provides specific forecasts for mountaineering expeditions, national events, sports events, yatras, elections and such other special purposes.

Numerical Weather Prediction : Numerical Weather Prediction (NWP) is the methodology to predict the future state of the atmospheric circulation and weather from a knowledge of its present (initial) state, using known physical and hydrodynamical laws of atmospheric motions. NWP was initiated in IMD as early as in 1973 with a simple model on an IBM 360/44 computer. A new computer, Cyber 2000U, supported by many peripheral equipments, was installed and commissioned at IMD in New Delhi in 1995. The New Delhi centre functions as a Regional Specialised Meteorological Centre (RSMC) under the WMO system for World Weather Watch. Most of the RSMC activities such as plotting of data on weather charts for synoptic analysis and production of prognostic charts, have been automated on the Cyber system with its comprehensive applications and graphics software package.

A Limited Area Analysis and Forecast System (LAFS) which comprises an advanced NWP model, has been implemented for short range forecasting.. The forecast model is also used for generating tropical cyclone track predictions.

Long Range Forecasts : IMD issues every year the Long Range Forecast for the southwest monsoon rainfall. The scientific basis for long range forecasting is that there are several signals prior to the monsoon which are indicative of its likely performance. The parameters having a bearing with the monsoon rainfall should not only be statistically well-correlated but also be physically relevant. Developing better techniques and improving the accuracy of the long range forecasts are two continuous research activities of IMD.

MEDIA  
COORDINATION  
&  
COVERAGE

THE TIMES OF INDIA, HYDERABAD  
SATURDAY, AUGUST 7, 2010

YOUR DAY

### Award ceremony

AP State Council of Science & Technology is presenting Andhra Pradesh Scientist Awards (APSA)-2010 at Jeevana Jyothi Retreat Home, Chikoti Gardens, Begumpet, at 9.30 am.

**TIMES OF INDIA**

## నగరంలో నేడు

సూర్య శనివారం 7 ఆగస్టు 2010

**SURYA**

◆ చికోటి గార్డెన్స్, బేగంపేట్ - ఎపి స్టేట్ కౌన్సిల్ ఆఫ్ సైన్స్ అండ్ టెక్నాలజీ ఆధ్వర్యంలో ఉదయం 9 గంటకు ఆంధ్రప్రదేశ్ సైన్స్ అవార్డుల ప్రధానోత్సవం.

ఆంధ్రభూమి

శనివారం, 7 ఆగస్టు 2010 హైదరాబాద్

## నగరంలోనేడు

అవార్డు ప్రధానం

అంశం: ఆంధ్రప్రదేశ్ స్టేట్ కౌన్సిల్ ఆఫ్ సైన్స్ అండ్ టెక్నాలజీ ఆధ్వర్యంలో ఆంధ్రప్రదేశ్ సైన్స్ అవార్డుల ప్రధానం

ముఖ్య అతిథి: రాష్ట్ర అటవీ శాఖ మంత్రి డా. పెద్దిరెడ్డి రామచంద్రారెడ్డి

వేదిక: జీవన్ జ్యోతి రీట్రీట్ హౌస్, చికోటి గార్డెన్స్, బేగంపేట్  
సమయం: ఉ. 9 గం.

శనివారం | ఆగస్టు 7 | 2010

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హైదరాబాద్

9



నగరంలో నేడు

### ఏపీ సైన్స్ అవార్డ్స్-2010

ముఖ్య అతిథి: అటవీ శాఖ మంత్రి డాక్టర్ పెద్దిరెడ్డి రామచంద్రారెడ్డి  
జీవన్ జ్యోతి రీట్రీట్ హౌస్, చికోటిగార్డెన్స్, బేగంపేట్, ఉదయం 9

ఆంధ్రజ్యోతి

14 శనివారం 7, ఆగస్టు 2010

సిటీ డైరీ

**ANDHRA**

**JYOTHI**

✽ బేగంపేట్: చికోటి గార్డెన్స్, జీవన్ జ్యోతి రీట్రీట్ హౌస్లో ఉ. 9 గంటలకు 'ఆంధ్రప్రదేశ్ సైన్స్ అవార్డ్స్'.

## నగరంలో ఈనాడు

**ANDHRA BHUMI**

✽ బేగంపేట్ చికోటి గార్డెన్స్లో ఉదయం 9 గంటలకు ఆంధ్రప్రదేశ్ రాష్ట్ర శాస్త్ర సాంకేతిక మండలి ఉత్తమ శాస్త్ర వేత్తల అవార్డు ప్రధానం



## శాస్త్ర పరిశోధనలు సామాన్యులకు ఉపయోగపడాలి



మేజర్ న్యూస్, సిటీబ్యూరో - శాస్త్ర పరిశోధనలు సామాన్యులకు, సమాజానికి ఉపయోగపడాలని, పర్యావరణాన్ని పరిరక్షించే దిశగా సాగాలని రాష్ట్ర అటవీ, పర్యావరణ, శాస్త్ర, సాంకేతిక శాఖ మంత్రి డాక్టర్ పి.రామచంద్రారెడ్డి ఆకాంక్షించారు. పురస్కారాలు గ్రహీతలకు నూతనాత్మేజాన్ని ఇవ్వడంతో పాటు సంబంధిత రంగంలో పని చేస్తున్న వారికి మరింత పట్టుదలను పెంచుతాయన్నారు. ఆంధ్రప్రదేశ్ రాష్ట్ర శాస్త్ర, సాంకేతిక మండలి అధ్యక్షంలో బేగంపేట్లోని జీవన్ జ్యోతి రిటైల్ హాల్ లో ఏర్పాటు చేసిన ఆంధ్రప్రదేశ్ సెంటిస్ అవార్డు -

రాష్ట్రం దేశంలోనే ప్రథమ స్థానంలో నిలిచిందన్నారు. ఈ కార్యక్రమానికి అధ్యక్షత వహించిన ఉస్మానియ యూనివర్సిటీ వైస్ చాన్సలర్ ప్రొఫెసర్ టి.తిరుపతిరావు మాట్లాడుతూ, సమాజానికి ఉత్తమ సేవలందించిన శాస్త్రవేత్తలను, విద్యావేత్తలను గుర్తించి వారిని గౌరవిస్తున్న రాష్ట్ర శాస్త్ర, సాంకేతిక మండలిని అభినందించారు. వివిధ కార్యక్రమాల ద్వారా పాఠశాల స్థాయి విద్యార్థుల్లో శాస్త్రీయ అవగాహన పెంచేందుకు కృషి చేస్తుందని అన్నారు. ఉస్మానియ యూనివర్సిటీ కాలేజ్ ఆఫ్ సైన్స్ ప్రిన్సిపాల్ ప్రొఫెసర్ కె.జనార్దన్ రెడ్డి మాట్లాడుతూ, అనుభవజ్ఞులైన శాస్త్రవేత్తలు యువ శాస్త్రవేత్తలను తగిన రీతిలో ప్రోత్సహించాలని, నవాక్షను ఎదుర్కొనే రీతిలో వారిని తీర్చిదిద్దాలని సూచించారు. శాస్త్ర, సాంకేతిక మండలి సభ్య కార్యదర్శి ప్రొఫెసర్ టి.వి.కృష్ణారెడ్డి మాట్లాడుతూ, అవార్డుల కోసం వివిధ విశ్వవిద్యాలయాలు, పరిశోధన సంస్థల నుండి రాష్ట్ర వ్యాప్తంగా 50 దరఖాస్తులు రాగా ఎవీకాస్స్ ఎగ్జిక్యూటివ్ కమిటీ ఫైర్మన్, మంత్రి పెద్దిరెడ్డి రామచంద్రారెడ్డిల అనుమతితో ఐదుగురిని ఎంపిక చేసినట్లు తెలిపారు. రాష్ట్ర మంత్రి డాక్టర్ పెద్దిరెడ్డి రామచంద్రారెడ్డి చేతుల మీదుగా ఉస్మానియ యూనివర్సిటీ ప్రొఫెసర్ వి.దశవంత్ రెడ్డి (ఐయాలజికల్ సైన్సెస్), యూనివర్సిటీ ఆఫ్ హైదరాబాద్ ప్రొఫెసర్ ఎం.జగినాథ స్వామి (కెమికల్

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SAKSHI

## సమాజ శ్రేయస్సుకు విస్తృత పరిశోధనలు



మంత్రి నుంచి అవార్డులు అందుకుంటున్న డాక్టర్ ఎం. అంజిరెడ్డి, దశవంత్ రెడ్డి, జగన్నాథస్వామి

### మంత్రి రాంచంద్రారెడ్డి

సిటీబ్యూరో, న్యూస్ లైన్: శరవేగంగా జరుగుతున్న అభివృద్ధితో పాటు దుష్పరిణామాలు కూడా సంభవిస్తున్నాయి, వీటి వల్ల ప్రజలు అనేక సమస్యలు ఎదుర్కొంటున్నారనివాటికి పరిష్కార మార్గాలను అన్వేషించాలని రాష్ట్ర అటవీ, పర్యావరణ శాఖ మంత్రి పెద్దిరెడ్డి రాంచంద్రారెడ్డి పేర్కొన్నారు. ఆంధ్రప్రదేశ్ కొన్ని ఆఫ్ సైన్స్ అండ్ టెక్నాలజీ అధ్యక్షంలో 'ఏపీ సైంటిస్ట్-2010' అవార్డుల ప్రధానోత్సవ కార్యక్రమం శనివారం బేగంపేట్లోని చికోటి గార్డెన్స్ లో నిర్వహించారు. ముఖ్య అతిథిగా పాల్గొన్న మంత్రి రాంచంద్రారెడ్డి మాట్లాడుతూ సమాజ శ్రేయస్సును కాంక్షిస్తూ శాస్త్రవేత్తలు విస్తృతంగా పరిశోధనలు చేయాలని ఆయన సూచించారు. సభకు అధ్యక్షత వహించిన ఉస్మానియ యూనివర్సిటీ వైస్ చాన్సలర్ ప్రొఫెసర్ టి.తిరుపతిరావు మాట్లాడుతూ పరిశో

ధన రంగం పట్ల విద్యార్థులు దృష్టి పెట్టేలా కృషి చేయాలని ఆయన కోరారు. సైన్స్ అండ్ టెక్నాలజీ రంగంలో విశేష పరిశోధనలకు గాను 'ఏపీ సైంటిస్ట్-2010' అవార్డును అందుకున్న పర్యావరణ శాస్త్రవేత్త(జీఎస్టీయూహెచ్) డాక్టర్ మారెడ్డి అంజిరెడ్డి మాట్లాడుతూ పర్యావరణ రంగంలో చేస్తున్న కృషికి గుర్తింపుగా ఈ అవార్డు రావడం సంతోషంగా ఉందన్నారు. ప్రొఫెసర్ దశవంత్ రెడ్డి(ఉస్మానియ యూనివర్సిటీ), ప్రొఫెసర్ జగన్నాథస్వామి(సింట్రిల్ యూనివర్సిటీ), ప్రొఫెసర్ వీరయ్య(ఆచార్య నాగార్జునవర్సిటీ), డాక్టర్ సుజాత(హార్దికల్చర్ యూనివర్సిటీ) అవార్డులు అందుకున్న వారిలో ఉన్నారు. వీరికి అవార్డుతో పాటు రూ.25,000 పారితోషికం, ప్రశంసా పత్రాలను మంత్రి అందజేశారు. కార్యక్రమంలో ఆంధ్రప్రదేశ్ కొన్ని ఆఫ్ సైన్స్ అండ్ టెక్నాలజీ సభ్య కార్యదర్శి ప్రొఫెసర్ టి.వి. కృష్ణారెడ్డి, ఓయూ కాలేజ్ ఆఫ్ సైన్స్ ప్రిన్సిపాల్ ప్రొఫెసర్ జనార్దన్ రెడ్డి పాల్గొన్నారు.



# రాష్ట్ర సాంకేతిక రంగాలకు వెళ్తుంటే



అవార్డులు పొందిన శాస్త్రవేత్తలతో మంత్రి రామచంద్రారెడ్డి

బేగంపేట, ఆగస్టు 7 (న్యూస్టుడే): శాస్త్ర సాంకేతిక రంగాల్లో రాష్ట్రం వేగంగా ముందుకు వెళుతుందని రాష్ట్రఅటవీ, పర్యావరణశాఖ మంత్రి పెద్దిరెడ్డి

అటవీశాఖ మంత్రి రామచంద్రారెడ్డి

రామచంద్రారెడ్డి పేర్కొన్నారు. శనివారం బేగంపేటలోని జీవనజ్యోతి ట్రస్ట్ సెంటర్ లో ఆంధ్రప్రదేశ్ స్టేట్ కోన్ఫ్ లో ఆప్ సైన్స్ టెక్నాలజీ సంస్థ ఆంధ్రప్రదేశ్ సైంటిస్ట్ అవార్డ్స్ (ఏపీఎస్ఎ)-2010 ప్రధానోత్సవం జరిగింది. ముఖ్యఅతిథిగా విచ్చేసిన మంత్రి మాట్లాడుతూ పరిశోధన రంగంలో ఉన్న వారికి అవార్డులు అందజేయటం ఎంతో సంతోషాన్ని ఇచ్చిందన్నారు. ఇయోలాజికల్ సైన్స్ లో ప్రొఫెసర్ వి.దశవంతురెడ్డి, రసాయన శాస్త్రంలో ప్రొఫెసర్ ఎం.కోగినాద స్వామి, బొటికల్ శాస్త్రంలో ప్రొఫెసర్ ఎన్.వీరయ్య, అగ్రికల్చర్ సైన్స్ లో డా॥ ఎ.సుజాత, ఇంజనీరింగ్ టెక్నాలజీలో డా॥ ఎం.అంజిరెడ్డిలు అవార్డులు అందుకున్నారు. కార్యక్రమం అనంతరం మంత్రి మూడు రోజుల పాటు జరగనున్న 'అండర్ స్టాండింగ్ వెథర్ అండ్ క్లైమేట్' అనే అంశంపై సదస్సును ప్రారంభించారు. వాతావరణ పరిరక్షణకు సంబంధించిన కీట్సు, 18వ బాలల జాతీయ సైన్స్ కాంగ్రెస్ డ్రాఫ్ట్ లను ఆయన ఆవిష్కరించారు. కార్యక్రమంలో ఉస్మానియా యూనివర్సిటీ ఉపకులపతి ప్రొఫెసర్ తిరుపతిరావు, యూనివర్సిటీ కాలేజ్ ఆఫ్ సైన్స్ ప్రెసిడెంట్ ప్రొఫె.జనార్దన్ రెడ్డి తదితరులు పాల్గొన్నారు.

EENADU

## వార్త

ఆదివారం 8, ఆగస్టు 2010

### శాస్త్రసాంకేతిక రంగాలలో రాష్ట్రం కీలకం

బేగంపేట, ఆగస్టు 7, ప్రభాతవార్త: శాస్త్ర సాంకేతికరంగాలలో శరవేగంగా సాధిస్తున్న అభివృద్ధిలో రాష్ట్ర శాస్త్రవేత్తలు కీలకపాత్ర పోషించడం హర్షనీయమని అటవీశాఖామంత్రి పెద్దిరెడ్డి రామచంద్రారెడ్డి అన్నారు. బేగంపేటలోని జీవనజ్యోతిరిటీట్ లో జరిగిన ఆంధ్రప్రదేశ్ సైంటిస్ట్ అవార్డుల పంపిణీ కార్యక్రమానికి మంత్రి ముఖ్య అతిథిగా హాజరయ్యారు. ఈ సందర్భంగా ఆయన మాట్లాడుతూ శాస్త్రసాంకేతిక రంగాలలో విశేషకృషి చేసిన సామాజిక విద్యావేత్తలకు 2010 సంత్సరానికిగాను ఉత్తమ శాస్త్రవేత్త అవార్డులకు ఎంపిక చేసినట్లు మంత్రి స్పష్టంచేశారు. ప్రభుత్వం ప్రకటించిన అవార్డులు శాస్త్ర సాంకేతిక రంగాలలో ఉత్తమ సేవలు చేస్తున్న పరిశోధకులకు మరింత ప్రోత్సాహం ఇచ్చినట్లు పుత్రులందరినీ ఆశాభావాన్ని ఆయన వ్యక్తంచేశారు. పర్యావరణంలో వస్తున్న మార్పులు చేర్పులు పలునవాళ్ళను ఎదుర్కొనుందన్నారు. సైన్స్ షూ, మలేరియా, డెంగూ ఫీవర్ వంటి ప్రాణాంతక వ్యాధులతో సామాన్యులు ప్రాణాలను కోల్పోవడం దురదృష్టకరమన్నారు. ఎన్.ఎ.పి.సి.సి (నేషనల్ ప్లాన్ ఆన్ క్లైమేట్ ఛేంజ్) సంస్ధ్వారా పర్యావరణపరిశోధనకుగాను ఎనిమిది ప్రత్యేకమిషన్లను గుర్తించి

నట్లు మంత్రి పెద్దిరెడ్డి వివరించారు. వాతావరణంలో వస్తున్న మార్పులు, ప్రకృతివైపరీత్యాలు, పునరావాస కల్పన తదితర అంశాలపై మూడు రోజులపాటు జరిగే వర్క్ షాపును మంత్రి ప్రారంభించారు. శాస్త్రవేత్తలకు అవార్డులు అందజేసిన మంత్రి శాస్త్రసాంకేతిక రంగాలలో విశేషకృషి చేసిన అవార్డు గ్రహీతల పేర్లను ప్రకటించి, వారికి అవార్డులను మంత్రి పెద్దిరెడ్డి రామచంద్రారెడ్డి అందజేశారు. వివిధ శాఖలలో ప్రతిభచూపిన వి.దశవంతురెడ్డి ఉస్మానియా యూనివర్సిటీ, ఎం.జోగినాధస్వామి యూనివర్సిటీ, ఎం. హైదరాబాద్, ఎన్.వీరయ్య ఆచార్యనాగార్జున యూనివర్సిటీ, ఎ.సుజాత పి.హిందీకల్పు రత్న యూనివర్సిటీ, ఎం.అంజిరెడ్డి జే.ఎన్.టి.యు హైదరాబాద్ లకు 2010 ఏ.పి సైంటిస్ట్ అవార్డులను పెద్దిరెడ్డి అందజేశారు. 18వ బాలల జాతీయ సైన్స్ కాంగ్రెస్ 2010 పోస్టరను మంత్రి ఆవిష్కరించారు. వివిధ విశ్వవిద్యాలయాలకు చెందిన పలువురు శాస్త్రవేత్తలు, పరిశోధకులు, సామాజికవేత్తలు చేస్తున్న కృషి అభినందనీయమని మంత్రి కీతాబీచ్చారు. ఈ కార్యక్రమం లో వైస్ చాన్సలర్ డి.తిరుపతిరావు, ప్రొఫెసర్. డి.వి.క్రిష్ణారెడ్డి తదితరులు పాల్గొన్నారు.

VAARTHA



Prominent Electronic Media Channels also covered the programme



**Role of Media :** Media plays crucial role in communicating science to public. It is a bridge which connects /conveys general public the works of scientists, developments in science and technology. It is a tool using which future scientists needed for the country can be inspired.

Recent success of various environmental campaigns to protect nature and it resources shows the role media can play on not just creating awareness among public. But evolve action oriented approach with resultant impact of change.

#### **LIST OF PARTICIPANT MEDIA ORGANIZATIONS**

<b>NAME OF THE CHANNEL /NEWS PAPER</b>	<b>TYPE OF MEDIA</b>
<b>TELUGU/LOCAL</b>	
1. SAKSHI	NEWSPAPER
2. EENADU	NEWSPAPER
3. VAARTHA	NEWSPAPER
4. ANDHRA JYOTHI	NEWSPAPER
5. SURYA	NEWSPAPER
6. ANDHRA BHOOMI	NEWSPAPER
<b>ENGLISH</b>	
6.. TIMES OF INDIA	NEWSPAPER
<b>TELIVISION CHANNELS</b>	
1. TV5	TELIVISION
2. ZEE 24 GHANTALU	TELIVISION

**Inauguration programme covered :** Media Coordination of workshop was great success this is evident from various press reports and coverage by print and electronic media of the workshop.

## **EXCERPTS FROM PRESS NOTE :**

**Prof. T.V.Krishna Reddy, Member Secretary, APCOST**, in his welcome address, made a presentation on the focus areas of APCOST and briefed the participants about the need-based, resource-based and location-specific projects/ programs being taken up by APCOST. He also briefed about the salient features of the Andhra Pradesh Scientist Awards – 2010 and Workshop for Master Resource Persons (MRPs) on Understanding Weather & Climate

**DR. PEDDIREDDI RAMACHANDRA REDDY GARU**, Hon'ble Minister for Forests, Environment, Science & Technology, Govt. of A.P. presented the Andhra Pradesh Scientist Awards (APSA)-2010 & inaugurated the Workshop for Master Resource Persons (MRPs) on Understanding Weather & Climate.

Addressing on the occasion, Dr. P. Ramachandra Reddy, Hon'ble Minister for Forests, Environment, Science & Technology, Govt. of A.P. urged the scientific community.

He opined that progress in any sector depends on the developments that are taking place in the fields of science & technology. Andhra Pradesh is one of the fastest developing states in the country with thriving scientific and technological workforce having presence all over the globe, he said.

The Honourable Minister also unveiled Weather Kit useful for demonstration purposes for the benefit of science teachers and students.

**Prof. T. Tirupati Rao, Vice Chancellor, Osmania University**, Hyderabad presiding over the program said the topics of the Workshop on understanding Weather and Climate being organized by APCOST are aptly designed to motivate the participants in attempting to bring about a change from the school-level

**Prof. K. Janardhana Reddy, Principal, Osmania University College of Science**, Hyderabad requested all the scientists and academicians to join hands together to come forward to make our state the hub for knowledge, innovation and creativity. He also advised the scientific community to guide the younger generations to make them more competitive, resourceful and science savvy.

Several Scientists, Academicians, Subject Experts, Expert Committee Members, Executive Committee Members, Resource Persons, District Coordinators and District Academic Coordinators from all the districts, Officers from APCOST participated in the Event.

THANK YOU